THE
AMERICAN JOURNAL OF PHARMACY.

JULY, 1850.

ART. XLVIII.—ON IMPORTATIONS OF IODINE.

By Alfred B. Taylor.

A brief notice of the character of importations of iodine within the past year or so, and of the effect upon it, of our present commercial regulations for excluding adulterations, may perhaps be not devoid of interest to the readers of the Journal, as the great and growing usefulness of this article, in the arts, as well as in pharmacy, renders it one of considerable importance.

Though by no means an abundant substance in nature, and though, fifty years ago, even its existence was unknown, yet it is tolerably well diffused, being found in the mineral, vegetable, and animal kingdoms. In the *mineral*, it has been discovered in various metallic ores, in the the horn silver of Albarradon, (*Mexico;*) in the white lead of the mines of Catorce;* in an ore of zinc from Silesia; in certain coals, as well as in many mineral springs—as the famous Saratoga waters, &c.: in the *vegetable*, it is found in almost all sea plants, in some, growing in fresh water lakes, and in a few of Mexico, growing on the plains and the mountains: in the *animal*, it is met

* Am. Jour. Pharm., Vol. ix., 177.

with in the sepia, or cuttle-fish, the sponge, (whose ashes yield iodide of sodium,) the oyster, in the liver of the cod-fish and it is believed of several other species of fish, and in a singular insect found in Italy.

While the marine animals and plants containing iodine evidently derive this substance from the ocean, it is remarkable that the quantity discoverable in sea-water, is exceedingly minute, the most careful chemical analysis exhibiting a mere trace of it: so that there must exist very peculiar powers of absorption or secretion in these plants and animals to enable them to obtain an appreciable amount; unless iodine should prove to be a compound substance.

It is from the sea-weeds alone, that iodine can be profitably extracted; and even from those varieties, which yield most, (perhaps ten times as much as more ordinary varieties,) the product is very small, the "kelp" or fused ashes of the weed constituting a slight proportion of the original plant, and this yielding on an average considerably less than a half per cent. of iodine.

It may be incidentally mentioned as a striking instance of the new directions given to industrial enterprise by the discoveries of science, that this kelp was formerly obtained solely for the carbonate of soda it yielded, (ranging from 2 to 5 per cent.,) while it is now chiefly valued for its iodine, and chloride of potassium. These two substances appear, as Mr. Whitelaw (a manufacturer in Glasgow) has stated, to observe a tolerably uniform ratio of quantity to each other, the kelp containing the most chloride of potassium, containing at the same time the most iodine.

The process of subliming the iodine from the aqueous solution of kelp is described in the U. S. Dispensatory, and more fully in Graham's Chemistry, and in Pereira's Materia Medica, and need not here be quoted. The British iodine is the only kind that has been imported into Philadelphia for the last two years, or since the recent drug law has been in operation. During this time there has been no

case presented of an adulterated article of iodine, though it is said to be frequently adulterated with black oxide of manganese, plumbago, coal, slate, sand, &c., and M. Herberger found in one sample, native sulphuret of antimony, and in another more than half the article composed of artificial graphite! * Dr. Christison, however, never met with any of these adulterations in his observations, and Dr. Pereira says, "in no samples of iodine which I have examined have I ever found any of these substances." (Mat. Med., i. 225.)

As iodine is obtained from an aqueous solution, as it is moreover volatile, (for though its point of volatilization is 347°, its vapor passes over to a considerable extent with that of water at 212°,)† it might naturally be inferred that it would be found very difficult,—without considerable loss,—to separate the iodine from this moisture.

Accordingly, this article, as met with in commerce, almost always contains a greater or less proportion of water,—the quantity of which is appreciable with tolerable precision by simple inspection, and unless considerable, in no wise affects its usefulness, as its chemical and medical properties remain unchanged; the only disadvantage being that the *variableness* of its amount of moisture interferes with uniformity in the strength of its medicinal preparations. Where the degree of dampness is well ascertained it obviously could not diminish the therapeutic value of its solutions, the principal form indeed in which it is administered.

Within a few years past, a process has been successfully applied of *resubliming* this substance, and obtaining it nearly or quite anhydrous; thus presenting the pharmaceutist (at an advanced price of course) with a pure article. I am informed by one of the leading chemical manufacturers of our city, that it has been but a very few years since this improvement in the manufacture, or rather in the

* Am. Jour. Pharm., vol. xviii., 77.

† Iodine evaporates at ordinary temperatures, and much more rapidly when damp, than when dry.

refinement of Scottish iodine has been effected. This, indeed corresponds with the assertion of Dr. Christison, made several years ago, that "until within a recent period, he had not met with any British iodine which did not contain from fifteen to twenty per cent. of moisture."* Dr. Pereira says (Mat. Med., vol i., 225.) "The iodine of commerce is *always* adulterated with variable proportions of water. An ounce, if very moist, may contain a drachm, or perhaps even a drachm and a half of water." These observations seem to show not only that the refinement of iodine is of recent introduction, but that the quality of the ordinary article has been much improved within late years, since it is believed that the average proportion of water to be found in the iodine of commerce at present, is far less than that above given. Certainly no example has occurred of any importation of this article to Philadelphia since the operation of the drug law, with any thing like this amount of moisture; the greatest amount thus far having been but five per cent. These two qualities of iodine—the ordinary, or "commercial," and the anhydrous or "resublimed"—form two very different and well defined varieties; the former occurring in irregular or amorphous lumps (with a frequent tendency to minute crystallization) having a dull bluish, greyish, or dark lead color, and characterized by its tendency to adhere to the bottle or containing vessel; the latter occurring in moderately small and uniform scales or micaceous crystals, of a blue or somewhat steel like color, and with a clean metallic lustre. The first contains an amount of water ranging from one to ten, or perhaps even fifteen per cent; the last is found varying from a condition of perfect dryness to one with a half or one per cent of moisture.

In the mercantile world, the term "Iodine" is still appropriated to the former variety, and wherever it is used in the market, or quoted in the London prices-current, it is

*U. S. Dispensatory, p. 391.

believed invariably to designate this article, while the purer variety is with equal uniformity characterised as "re-sublimed" or "sublimed" iodine. The average price of the latter in London, is about 50 per cent. higher than that of the former, the one being worth at present about eight pence per oz. the other about one shilling per oz.

The following table exhibits the amount of each kind imported into our city during the last year, and thus far the present year.

	Commercial.	Re-sublimed.	Total.
1849	17,003 oz.	4,432 oz.	21,435 oz.
1850	9,406	4,484	13,890
	26,409	8,916	35,325

This whole amount of iodine was of excellent quality; the commercial article being found perfectly pure with the exception of a degree of moisture ranging from 2 to 5 per cent.;*—the resublimed affording no appreciable trace of any impurity.

The opportunity may here be taken of presenting a few remarks on the action of our law for preventing the importation of adulterated drugs, upon this article, and the difficulties which have arisen in regard to its practical application to particular cases. One subject of doubt which early presented itself to the different Examiners appointed under the law, was the propriety of requiring the same standard of excellence for drugs and chemical preparations not designed as for those designed for medicinal application: and it had been the practice at one at least, of our ports, to make a

*An analysis of some commercial iodine, (said to be of the same kind as a lot included in the above,) made by Prof. Hays of Boston, for the Examiner of that port, gives the following result:

"Water,	.68
Muriatic acid,	.13
Pure iodine,	99.19=100."

A degree of purity not often surpassed by the refined article.

discrimination in favor of such articles as had not such destination. In consequence, however, of the rejection of some iodine, the importers made application to the Treasury Department to allow their condemned lot to be delivered, on their giving bond to the U. States, that the article should be re-manufactured, or used exclusively in the arts. The Hon. Secretary of the Treasury, by instructions dated July 16th, 1840, replied, "On a careful examination of the law, the Department is unable to discover any authority to direct such delivery or to sanction any departure from the course prescribed;" and accordingly the only consideration which could since be entertained by the Examiner in deciding upon the admissibility of any drugs, medicinal or chemical preparations, "used wholly or *in part* as medicine," has been their "fitness for medical purposes"—whatever might have been the object for which such articles had been imported. As was to have been expected some little dissatisfaction has been occasionally expressed by those who have been incommoded by this restriction.

It might, perhaps, have been questioned whether by the spirit of the law, a bond or other satisfactory evidence of the destination of chemicals, did not indeed furnish the very ground of determining the Examiner's jurisdiction in the matter. By the provisions of the act, drugs imported into this country are to be condemned, and destroyed (unless re-exported out of the limits of the U. S. within six months after the condemnation,) if they are found "to be so far adulterated or in any manner deteriorated, as to render them inferior in strength and purity to the standard established by the United States, Edinburgh, London, French and German pharmacopœias and dispensatories, and thereby improper, unsafe, or dangerous to be used for medicinal purposes."

With what justice can an article be pronounced improper, unsafe or dangerous for medicinal use, which is known to be wanted for no such application? Is it not somewhat incongruous that fitness for *medical* purposes should be

required in a chemical preparation, purchased and designed for a different purpose—for assisting the inquiries of science, or for enriching the products of art? To the allegation made to the daguerreotype artist, for example, that his importation of wet iodine (supposing it to be really desirable) was not a "proper" medicine, he might very reasonably reply that it could not be an *improper* one, since it was no medicine at all.* Might not the principle, rigidly enforced be extended to the rejection of all crude drugs, or chemical materials? in other words to the almost complete suppression of our chemical manufactures? it being well known that the fine and high priced preparations cannot be advantageously employed in obtaining chemical products, and would not give these products any superiority if they could be thus employed.

On the other hand, it may be urged that to allow the distinction advocated, and make alleged destination the criterion of admissibility for drugs of doubtful character, would open the widest door to a fraudulent evasion—if it would not almost defeat the very object—of the law; that it would afford the dishonest importer as full opportunities as could be desired, of gathering from abroad, and vending his inert or noxious drugs, at comparatively little risk;—that the enforcement of the penalty, if he saw fit to forfeit his bond, would constitute a poor reparation of the injury the community might sustain by his impositions; and that on the whole, the interests of the public would probably suffer less by an unjust restriction, than by an undue extension of the freedom of trade.

A question of much greater delicacy and uncertainty, arises as to the degree of purity which should be demanded in iodine, to fairly meet the requisition of the act of Con-

* The manufacturer of quinine might offer the same justification of a low priced, or damaged article of Peruvian bark. And yet either article would have to be condemned, with the sole explanation, that although best adapted to the objects of the respective importers, it would be unsuitable for another very different purpose.

gress. The standards of purity in medicinal preparations recognised by the statute, are those established by the various pharmacopœias and dispensatories; construed by the circular instructions of the Department of July 8th, 1848, to intend in the case of such preparations—"the pharmacopœia and dispensatory of the country of their origin" respectively. As the only importations under the law (as has already been mentioned) have been of British iodine—manufactured exclusively at Glasgow, the only legitimate authority by which the Examiner is to be governed is of course the Edinburgh Pharmacopœia. This work unfortunately assigns no distinct degree of impurity as the limit of goodness. It recognises "the almost uniform presence of water in commercial iodine," and its consequent unsuitableness "for making preparations of uniform strength," and lays down certain directions for drying it, "till it *scarcely* adheres to the inside of a dry bottle:" giving thereby a sanction to an article of considerable dampness, and by its direction to the pharmaceutist, a clear implication that he may have occasion to use it. From the fact that "pure iodine, diffused in water, forms a clear solution with a certain proportion of quick lime," the pharmacopœia has also given a method of detecting its moisture, when it exceeds two per cent.

In the absence of any more direct standard, as well as of any specific regulations or instructions, it is not surprising that on a subject based ultimately on grounds of general expediency, there should have been a difference of opinion among the Examiners. However to be expected, such diversity was doubtless much to be regretted, as interfering materially with both the estimation and the efficiency of the law. Finding that the practice at different ports had been marked by considerable discrepancy, and having no decisive rule by which to act, the Examiner at Philadelphia could only exercise his best judgment, guided by the opinions of those on whose experience and information he could most rely.

Considering that the presence of a small quantity of water in commercial iodine is neither designed nor calculated to deceive as to its quality; considering also that it is not an *addition* to the article, but a want of perfection in the process of its purification, it seems hardly a correct application of language to designate it as either an "adulteration" or "deterioration," considering, moreover, that this article may be advantageously employed, when of ascertained strength, in a variety of pharmaceutical preparations, still less can it fall within the category of drugs "improper, unsafe or dangerous to be used for medicinal purposes."

From a sincere desire to establish for our city a high standard of excellence in its imported drugs without bearing too severely upon the honest importer, the limit of moisture in commercial iodine was fixed at five per cent.,—a purely arbitrary point, but one which was believed to represent a good quality of the article, and one at which it might in many cases be safely and beneficially employed. Such were the views and the practice of the Examiner at this city, when informed by the importers that a lot of their iodine had been condemned at Boston, though the same quality had been admitted into Philadelphia."*

Communication was held with the Examiner at that port, and also with the Secretary of the Treasury, detailing the grounds of the course pursued at this place, and asking from the Department more specific instructions, in order to secure a greater uniformity of action in the administration of the law. The reply to this request (received March 23d, 1850,) transmitted a copy of special instructions, which had long previously been given to the Examiner at the port of New York, but which were now communicated to this port for the first time. These instructions having reference

* It is proper to state that this lot of iodine was afterward permitted to pass the Custom House at Boston.

to a disputed case of condemnation of iodine at New York,† confirmed the rejection, on the ground of the iodine being "inferior in strength and purity to the standard established by the Edinburgh Pharmacopœia," which the Examiner stated to be "*about* 98 parts!"

Although this decision of the Department is predicated on a representation entirely erroneous,—the Edinburgh Pharmacopœia establishing for this article *no* standard of strength and purity, and in its definition of "Iodineum" giving an account of a substance certainly very different from one containing "about 98 parts,"—it nevertheless forms the authoritative exposition of the statute, and of course leaves the Examiner (whatever may be his own views of its propriety,) no discretion in carrying out its requirement.

The effect of this restriction is almost to exclude the article known in commerce as "iodine;" (which is believed rarely to attain the dryness of 98 per cent.;) and to require the "re-sublimed" article, although this had been introduced but a year or two previous to the passage of our law, and *since* the publication of the Edinburgh Pharmacopœia, on the supposed authority of which, the requisition was adopted!

Can it have been the design of the act for preventing adulterated importations, to exclude a character of chemical from our ports, because the progress of science had recently enriched the market with a superior quality of manufacture? Shall the fact of a "first quality" be supposed necessarily to vitiate and supersede a "second quality" of the same article? in a case, above all, where the one can neither be imposed nor mistaken for the other?

It is worth mentioning that the market article "iodine," has a much larger demand than the "sublimed" preparation; being extensively used in the manufacture of a valuable class

† An analysis of this iodine by Dr. Reid, of N. Y., gave

Water, - - - - - -	6.
Pure iodine, - - - -	94.=100.

and he returned it as "improper for medical use."

of medicinal agents—the *iodides;* more particularly the *iodide of potassium.* Singularly enough, while this latter article if imported, pays a duty of 20 per cent., the iodine from which it is manufactured pays a duty of 30 per cent., their commercial value being very nearly the same; thus giving the foreign preparation an encouragement of about 10 per cent., against which the American manufacturer must struggle, even when sure of obtaining his material.

In order to show how differently this subject is appreciated by other governments, it may be stated that by the tariff of France, "iodine" is now admitted into that country free of duty; so that while the policy of the one country offers a liberal encouragement to its importation, that of the other has been not only to restrain its introduction, but by the recent practical operation of its laws to confiscate it when received, and thereby (it is needless to add) totally to abolish from the United States an important manufacture.

No reference thus far has been made to the French iodine, though to France belongs the credit of the discovery—not only of the article itself, but of the process of purifying it from water by re-sublimation. Although imported from France in the refined or anhydrous state, long before such improvement had been attempted in Great Britain, it is manifest that no considerations of the superiority of this article to the Scottish, could properly influence the Examiner's estimate in deciding upon the comparative excellence of the latter; since by the instructions of the Treasury Department already referred to, the only standards admissible in determining the strength or quality of a drug, are those of the country of its exportation. Of course the British iodine must be judged alone by British authority.

Almost immediately upon the discovery of iodine by M. Courtois at Paris, the manufacture of the article was commenced in Scotland, and was prosecuted there with even superior facilities to those of its native country, in consequence of the abundant accumulations of iodine sea-weed on its more favorably situated coast, and the adjacent islands.

It was not long before the manufacturing chemists of France succeeded in preparing an article perfectly free from water; and during a year of considerable scarcity in the production of iodine in that country its ports were thrown open to the admission of the British article; which was re-sublimed and much of it re-exported to the country of its origin. The French iodine thus acquired a reputation for purity, which has since been uniformly sustained; although the present English re-sublimed, is in no respect inferior. There is a slight difference between them in the shade of color and general appearance of the crystals, which is readily recognised by those accustomed to their peculiarities; though no appreciable difference is presented by a chemical examination. The distinction is probably produced by a difference in the material of the retorts from which the iodine is evolved, and possibly by a trace of sulphur in the British article (too small to be indicated by ordinary tests,)—derived from the sulphuric acid with which it is prepared;—the French being as is believed, prepared with muriatic acid.

The application of our drug law has been spoken of as having occasionally received a somewhat rigid construction, and as having acted oppressively in particular instances, on the honest importer. However this may be, there can be but one opinion as to the general benefit of the regulation, and it is believed that our leading importers themselves would be among the last to wish the law revoked. The community has been protected—at least from foreign adulterations, and there can be no doubt that the general character of our drugs has greatly improved within the last two years. Importers have been rendered far more cautious in the quality of chemicals ordered from abroad, and whenever inferior articles have been presented, which has been of comparatively rare occurrence, they have been promptly rejected. If any relaxation of the standard of commercial iodine should be found desirable, such a degree of purity will doubtless be ultimately adopted as an enlarged and liberal view shall show to be most conducive to the interests of all.

ART. XLIX.—ON AMERICAN NARCOTIC AND OTHER EXTRACTS.

About four months ago the Editors of this Journal received from Messrs. Tilden and Co., of New York, four specimens of Vegetable Extracts prepared at their establishment at New Lebanon, New York, derived respectively from Conium, Hyoscyamus, Taraxacum and Sanguinaria, and the reception of which should have been acknowledged in our last number, but owing to accident they were overlooked at the proper time.

The chief merits claimed by the manufacturers for these extracts, are such as arise from a proper selection of the crude material grown in their extensive botanical garden, and from a careful preparation of the extracts by means of apparatus for evaporation in vacuo. We have here all the elements for their successful fabrication—assuming that the plants are imbued with their natural medicinal force and that the operators understand the principles of the process.

In reference to the specimens submitted, we will observe that whilst they present in an eminent degree the sensible properties of the plants they represent, we consider them to be deficient in a few particulars which we will notice, not in a hypercritical spirit, but with a view to the improvement of the articles noticed, so far as it can be done by hints. It may be well to state here that we believe that any manufacturer who justly claims the patronage of pharmaceutists, should be careful to derive his products from the precise sources designated in our National Pharmacopœia; and avoid embracing in them any substance not called for in that authority.

1st. *Extract of Dandelion.*—This extract is too soft, having a pulpy consistence; the evaporation has not been carried far enough; it has an herbaceous odor, and dark olive green color, due to the chlorophyllin of the leaves, the

whole plant having been extracted. The root only should be employed, and that collected between the first of September and the first of November. Extract of dandelion should be brown or dark brown, a bitterish slightly sweet taste, acid to litmus, and a consistence suitable for pills. The Pharmacopœia formula is defective in directing this extract to be made by boiling. The effect of heat continued for a length of time on the juice of dandelion is to decrease and ultimately destroy its bitterness, and to give to the extract a saccharine taste and molasses like consistence.

We have a specimen of this extract before us made by the "United Society" of New Lebanon, marked "extra," and prepared from the roots only, which has this objection —indeed it is so sweet as to be rather agreeable to the taste. We have another specimen that was prepared strictly according to the following directions, viz:

The roots removed from the earth late in September, were washed, sliced transversely, and well bruised. To each pound of the pulpy mass three ounces of alcohol were added, the whole left to macerate for thirty-six hours in a covered vessel, then expressed, strained and evaporated on a water bath to the pilular consistence. Thus prepared it has a brown color, a decided bitter sweet taste, and has been approved by medical men.

We believe if Messrs. Tilden & Co. would employ the root only, either with or without the alcohol, (which was used to allow of the maceration,) and remove the fluid portion by powerful pressure, subsequently repeated after moistening the residue with its weight of water, that with their superior advantages in conducting the evaporation, they would be able to furnish an extract of dandelion of great superiority.

2d. *Extract of Blood-root.*—This specimen, which is called an alcoholic extract, has a soft consistence like candied honey, a dark red color, and is highly active. It is too soft, however, and probably from the presence of some uncrystallizable sugar, exhibited evidences of fermentation.

3d. *Extract of Hemlock*, (Conium.)—This sample, now nearly five months in our possession, has a soft pulpy consistence, dark green color, and the heavy, peculiar odor of the plant when bruised. When triturated with powdered caustic potassa, the peculiar mouse-like odor of conia became strongly perceptible, together with a pungency due to ammonia eliminated by the potassa from the natural ammoniacal salts. When compared by this test with the best English extract we have met with, it quite equals it. There is perhaps no instance where vaccuum evaporation is more applicable than in reference to Conium, the active principle of which, in a free state, passes off with evaporating water like a volatile oil. Now, although conia exists naturally combined with an acid, yet we have reason to believe that this natural combination is not so fixed as to resist the decomposing agencies of heat and exposure to which the juice is often exposed before its final inspissation. If Tilden & Co's. extract of conium was of the proper pilular consistence, and had the chlorophylle removed, (according to the Pharmacopœia, it would leave little to be desired.

In observing closely the specimen before us we observe numerous brown spotson the surface of the extract against the glass, in which, owing to excess of moisture a slow fermentation has commenced, resulting in the destruction of the chlorophylle and the formation of an acid, probably the acetic, as according to the label alcohol has been used in its preparation. This change would not have occurred had the extract been of firmer consistence. The general mass of the extract has about the same degree of acidity observable in the English article.

Extract of Henbane, (Hyoscyamus.)—This extract, as it now stands before us, consists of a dark green pulpy mass, with here and there through it, and on its surface, separated portions of a dark brown syrupy liquid, arising from the insufficient evaporation of the extract originally, and the

subsequent separation of the insoluble chlorophylle and albuminous portion, from the softer soluble part. It is not more acid than the English, nor is there any evidence of local decomposition as in the preceding. It has the heavy narcotic odor of the bruised plant very strongly manifest, owing no doubt to the low temperature at which it was prepared.

We have not seen the extracts of Belladonna and Stramonium as prepared by Tilden & Co., but presume they are similar in quality with those we have described.

Since writing the above, we have conversed with Dr. Conrad, of the pharmaceutical department of the Pennsylvania Hospital, in reference to these extracts. He informs us that the extract of Conium of Tilden & Co. has been used in that Institution with decided satisfaction—equalling the English extract, in the opinion of the physicians of the House. We are gratified to hear this testimony in favor of the American extract, because it leads to the inference that the ill success which has attended its use on many occasions may be attributed to faulty preparation or ill-timed gathering of the plant, rather than to our climate.

Mr. Tilden informs us that his apparatus consists principally of two evaporators, one capable of holding several hundred gallons, designed for concentrating the liquid to a a syrupy consistence, and which is heated by steam circulating in tubes penetrating the interior of the evaporator. An exhausting pump constantly acts on the atmosphere of this vessel so as to reduce the boiling point to about 140° Fahr. The openings of this boiler are comparatively small, as the concentrated juice infusion or tincture can be drawn off by a cock beneath. The other evaporator, in which the extract is finished, is much smaller. The openings are larger, so as to admit of the removal of the extract when finished. We presume there are certain practical difficulties that present themselves, in the use of this arrangement, after the product has attained a certain consistence, and this may be the reason of the softness of the extracts noticed,

but if such *is* the case it would be better to achieve the evaporation in an open water bath vessel with constant stirring, than to have the extracts as we have described them.

Much has been written on the effects of climate in modifying the medicinal power of plants, by changing their chemical composition and augmenting or diminishing their activity. It has been repeatedly averred that the European narcotics most in use, when grown in this country, are decidedly less potent, than in their native soil. Enough is already known in this department of botanical science to give some credit to the opinion, but we should greatly prefer to have the point fairly tested in relation to Conium, Hyoscyamus and Belladonna. The first two of these we are informed have been acclimated in some localities, in the Northern States. We have seen Belladonna, this season, growing with rank luxuriance in the garden of Professor Wood of this city. To arrive at a good result it would be necessary to have the extracts prepared with care, and tested therapeutically by a physician interested in the subject at one of our hospitals, where the English extracts may be in use. It would be very gratifying to get favorable results, and we should be most happy to make our pages the vehicle for communicating them, should any of our medical and pharmaceutical friends be disposed to assume the task.

In conclusion we will remark, that the extracts of Messrs. Tilden and Co. are enclosed in fluted glass bottles, the corks faced with tin foil and securely covered with a metallic cap. If these gentlemen will bring to bear on their manufacturing operations all the light of pharmaceutical science, and adhere to a conscientious construction of the National Pharmacopœia, their products will prove to be a boon to the medical community, and we doubt not that eventually they will receive a substantial reward, both in increased confidence and patronage. W. P., Jr.

ART. L.—ON THE IMPORTANCE OF A MORE CONSCIENTIOUS ATTENTION TO UNIFORMITY OF STRENGTH IN THE PREPARATIONS OF OPIUM.

In some remarks by M. Chevallier, published in the *Journal de Pharmacie* for January, the importance of a more general and thorough attention to the strength of the preparations of opium was shown to be necessary. He says that three kinds of opium are used in France: Smyrna, Constantinople and Egyptian, in which the morphia varies from four to ten per cent. The *Codex* directs selected opium (opium choisi) without specifying the commercial variety, but says M. Chevallier, will the pharmaceutist select Smyrna, or Constantinople, or Egyptian? Assuming that he choses the first or strongest, the quality of the article varies from several causes. 1st, In the amount of moisture which varies from 5 to 25 per cent. at least, according to the age and original moistness of the drug. 2d, To the extent of adulteration, as it is presumed that the pure exudation rarely, if ever, enters general commerce. The value of this opium, as indicated by the per centage of morphia, is shown to be very variable, as it containsfrom 2 or 3 to 10 or 12 per cent., as observed in this city, although it is rare to meet with a weaker opium than 5 or 6 per cent. If it were possible to base the proportion of opium in its preparations on its morphia strength, no difficulty would be experienced, but unfortunately a rapid, easy and reliable process for the extraction of morphia is yet a desideratum.

The French Codex says nothing in reference to the hygrometric condition of the opium. The United States Pharmacopœia, by directing the opium in its preparations to be in powder or coarse powder, guards against this source of variation. But unfortunately, little regard is had to this recommendation—the opium is used in the state it is found, at the time it is wanted, without regard to its dryness. It must be acknowledged that it seems a use-

less labor to dry opium for the purpose of making laudanum when it is in a moist condition, but there is no excuse for not allowing for the water it contains. If 100 grains of the moss, representing the exterior and interior, be carefully dried over a lamp or stove, the number of grains of loss will indicate the per centage of moisture. Then by a simple rule of proportion, the condition of the opium can be arrived at. Suppose the loss is 9 grains, and the operator desires the weight of moist opium for a gallon of laudanum, proceed thus: as 91 grs. (the dry opium in 100 grs. of the moist,) is to 100 grs., so is 4800 grs. (10 oz.) to 5275 grains, or very nearly 11 ounces.

Another serious source of variation in this class of preparations is the use of avoirdupois instead of troy ounces, making a difference of one-eleventh. Even this reduction, which is as frequently the result of oversight as design, is not as serious in its consequences as that which arises from a deliberate depreciation of the quantity of opium with a view of lowering the price of the tincture per ounce. A distiller may make alcohol with any amount of water hep leases, but when the inspector examines it, he decides its value by its alcoholic strength, and the buyer is not deceived, but it is very different with a medicine on the action of which life may hang. Before the Drug Law was in operation, we recollect an instance where opium, containing but 2 per cent. of morphia, was bought up by a retailer for conversion into laudanum, and the mere fact that it was sold as, and had the apparent qualities of opium, was sufficient to satisfy his mind, although the price paid for it was not one-third of the value of good opium.

The law for the prevention of the importation of adulterated drugs, medicines and chemicals, which is now in force at our custom houses, will, if properly inforced, in a great degree, prevent the introduction of bad opium. We have understood that the inspectors have assumed 9 per cent. of morphia as the strength necessary to pass the drug, and if carried out faithfully,

we will not hear much of bad opium, at least in orignal packages. After all the checks of law, rogues will yet have their way, and nothing but education and principle in those who have the practice of Pharmacy in their hands, will prevent either fraudulent practices on the one hand, or errors of judgment on the other, in relation to this important subject. W. P., Jr.

ART. LI.—MINERAL WATER SYRUPS.

By Ambrose Smith.

We have thought that the results of some experience in the preparation of these syrups which most city apothecaries have frequent occasion to make, might be interesting to many of the readers of this Journal.

Lemon Syrup.—This is now almost universally made from citric or tartaric acid, oil of lemon and water, instead of lemon juice. Some of the confectioners when they are overstocked with lemons make them into syrup, but from the use of fruit that has partially spoiled and from the syrup being made in such large quantities at once, as to become more or less altered by keeping before it is consumed, the article thus made is usually inferior to that made from acid and oil of lemon.

Citric acid is decidedly preferable to tartaric for preparing it. The syrup made with the former acid has a more agreeable flavor which it retains longer unimpaired. We have found the syrup made with tartaric acid, when long kept, to throw down a bulky white granular deposite which was apparently grape sugar. The flavor of the syrup changes gradually on keeping long, even when made with citric acid. This is probably due to some change in the oil of lemon by which the syrup acquires a terebinthinate flavor. This turpentine taste is very common in the lemon syrup which is manufactured and sold wholesale, and may frequently be due to the employment of impure oil of lemon. A common

adulteration of this oil is the admixture of recently distilled oil of turpentine, or "camphene," and the adulterated oil may contain a considerable portion of it, without its being perceptible by taste or odor while new, but as the camphene becomes resinous, the turpentine flavor is developed. But even pure oil of lemon degenerates in flavor and odor when long kept, and the alteration is probably more rapid when it is diffused through the syrup and assisted by the action of the acid; therefore we have found it most advantageous to prepare the syrup in small quantities so that it will be consumed before there is any change in its quality. The following formula we have been accustomed to follow, by which a pleasant syrup can be made in a few minutes.

Take of Oil of Lemon	½ fl. dr.
Citric Acid	1 oz.
Simple Syrup	1 gall.

Rub the oil of lemon first with a little powdered sugar, and afterwards with a portion of syrup, dissolve the citric acid in an ounce or two of water, and mix the whole.

Ginger Syrup.—The formula of the Pharmacopœia makes a syrup of about the proper strength for use with mineral water. As it is usually made in considerable quantities it will be found most convenient to prepare the simple syrup at the time, and while it is hot to pour on the surface the tincture of ginger, allowing the alcohol to evaporate before mixing with the syrup. If the tincture is mixed directly, the syrup will be cloudy; on the other hand, if it is allowed to remain too long on the surface of the hot syrup before mixing, the resin separates in globules which can not afterwards be thoroughly diffused through the syrup. The tincture should be allowed to evaporate from the surface of the syrup until the vapor ceases to ignite on the approach of flame, then mixed immediately.

A good method of making ginger syrup is to pour the tincture on to the sugar, which is to be exposed to the air until the spirit has evaporated, and then made into syrup. This

plan is more operose however, and does not answer better than the one indicated above.

CAPSICUM SYRUP.

Take of Simple Syrup	2 pints.
Tincture of Capsicum	1 fl. oz.

Proceed as for ginger syrup.

SARSAPARILLA SYRUP, for mineral water. As this syrup is intended for making a pleasant beverage, it is made much weaker of sarsaparilla than the compound syrup of the Pharmacopœia, and the senna, guaiac, &c., which enter into the composition of the latter, are very properly omitted.

The following is the formula we have been accustomed to employ. Take of

Sarsaparilla, finely bruised, }	each, 2 lbs. (avoir.
Liquorice Root, do. }	
Sugar	30 lbs. (avoir.)
Oils of Anise, Wintergreen and Sassafras,	each, 40 drops.
Oil of Cinnamon,	5 drops.
Water,	q. s.

Digest the roots 12 hours with 2 gallons of warm water, then put into a displacer and displace, adding sufficient water, until 2 gallons of infusion are obtained. In this dissolve the sugar with the aid of heat, and to the syrup when cooled, add the oils previously rubbed up with a little sugar.

The following formula is employed by some of the druggists of this city.

Take of Sarsaparilla, Liquorice root,	each 1 lb.
Cinnamon, Sassafras,	each 6 oz.
Cloves, Anise, Coriander,	each 2 oz.
Red Saunders, Cochineal,	each 1½ oz.
Alcohol,	2 pints.
Water,	2 gallons.

Digest the above for 4 days, strain and make a syrup with 27 lbs (avoir.) sugar.

It is also frequently made by diluting the compound syrup with twice its measure of simple syrup, and adding the essential

oils. The fluid extract of sarsaparilla, if mezereon enters into its composition, does not answer, as the persistent acrimony of this bark is so perceptible even in the diluted syrup as to make it unpalateable.

ORGEAT SYRUP.

Take of Sweet Almonds,	12 oz.
Bitter do.	4 oz.
Sugar,	6 lbs. (avoir.)
Water,	q. s.
Orange-flower Water,	4 fl. oz.

Blanch the almonds, pound them thoroughly in a marble mortar, mix gradually with 1½ pints of water and strain with expression. Repeat the process with 1½ pints more water, and make up the strained liquor to 3 pints, in which dissolve the sugar with a gentle heat. When cold, add the orange flower water, and mix.

It is well to soak the blanched almonds in cold water for some time, as it renders them easier to pound up. Orgeat syrup should not be boiled, as this would coagulate the albumen of the almonds and cause the syrup to separate.

It is important to the keeping of fruit syrups, especially, that they should be nearly saturated solutions of sugar; they should mark 36° Baumé at 60°. Fifteen or 16 pounds avoirdupois of refined sugar to the gallon of liquid will generally make 2 gallons of syrup of the proper density. It is better however if the syrup is to be kept any length of time to test the density by the saccharometer. Light Havanna or Brazil sugar will do for many syrups, but as these sugars are usually damp, it is necessary to use them in rather larger proportion. There is so little difference in price that it is scarcely an object to use any but refined sugar. The kind sold as crushed loaf is the most convenient for dissolving.

STRAWBERRY SYRUP.—Strawberries yield from one-third to one half their measure of juice, according to the quality of the fruit. They should be fully ripe, but freshly gathered and free from decay. The syrup is sometimes prepared by

throwing the fruit by portions into a thick boiling syrup. In this way the juice is dissolved into the syrup, the marc left floating on top and separated by straining the syrup through a conical flannel bag. The syrup is to be brought to the proper density afterwards by adding either sugar or water as required.

We have found this method rather troublesome, and prefer to express the juice. The following is the formula we have frequently employed; we give the quantities for about 8 gallons of syrup. Take 30 quarts of strawberries, mash them with the hands in a wooden tub, and put them on a strainer of coarse strong unbleached muslin. When all the juice has passed that will without pressure, tie the edges of the strainer together so as to form a bag, and by means of a press express the remainder.

Take of Sugar,	64 lbs. (avoir.)
Water,	2¼ gallons.

Heat in a tinned copper pan over the fire, stirring the sugar until it is dissolved or nearly so, and the syrup begins to boil, then mix the strawberry juice (which will be about 2½ gallons,) and continue the heat until the syrup has boiled two or three minutes. The syrup should mark 31° Baumé while boiling, and must be brought to that density, if too thin, by boiling a few minutes longer, if too thick by adding water. After removing from the fire skim and strain the syrup.

If it is intended to be kept long it is better to bottle it while hot, and when cold to lay the bottles on their sides. The bottles olive oil comes in (well cleaned) answer very well; druggists generally have them on hand and have little other use for them, and as the glass is thin, they are not apt to break from the heat of the syrup.

Raspberry Syrup.—We have made good raspberry syrup as follows. Raspberries 36 boxes, (such as they are brought to our market in,) sour cherries, (murillos or other good pie cherries,) 4 lbs. Obtain the juice, which will measure about

2 gallons, and use 60 lbs. (avoir.) sugar, and 2 gallons of water, and proceed as above directed for strawberry syrup.

The cherry juice gives a tartness which improves the flavor of the syrup, and its use seems to diminish the tendency to gelatinize, which is a troublesome peculiarity of this syrup.

RASPBERRY VINEGAR.

Take of Raspberry Syrup,	2 pints.
Acetic Acid, (No. 8.)	½ fl. oz.

Mix them.

BLACKBERRY SYRUP.—Made in the same manner as strawberry. As this is rather an insipid syrup, it would probably be improved by adding some aromatics as cloves and cinnamon.

PINEAPPLE SYRUP, is sometimes made by putting sugar on slices of the fruit as detailed by W. Procter, Jr., in his edition of Mohr and Redwood.

This method makes a nice syrup, but we prefer the plan of expressing the juice as being more convenient, and in our experience, making an equally agreeable preparation. Pare the pineapples and mash them, without slicing, in a marble mortar and express the juice. Mix the marc with half as much water as there was juice obtained, and express again. To the latter liquor and half the juice add the sugar, and heat until it is dissolved, then mix the remaining juice and continue the heat until the syrup begins to boil. Remove from the fire, skim and strain.

ORANGE SYRUP.—Grate off the yellow outside peel, cut the oranges and express the juice with which a syrup is to be made as directed for pineapple syrup, and when it begins to boil mix the grated peel with the syrup and allow it to infuse in a covered vessel till cool, then strain.

One dozen fine oranges will make 1½ to 2 gallons of syrup.

VANILLA SYRUP.

Take of Vanilla,	6 drs.
Boiling Water,	4½ pints.
Sugar,	8 lbs. (avoir.)

Reduce the vanilla to coarse powder with a portion of sugar, and infuse in the boiling water 2 hours; then strain and dissolve the sugar in the infusion. Or,

Fluid extract of Vanilla,	½ oz.
Simple Syrup,	1 pint.

Mix.

NECTAR SYRUP.—Various mixed syrups have been sold under this name. A mixture of ginger and sarsaparilla makes a syrup resembling the "nectar syrup," of one of our mineral water manufacturers. A mixture of orgeat and strawberry is used in some establishments under this title.

ART. LII.—ON THE ALCOHOL-TEST OF THE PURITY OF CASTOR AND CROTON OILS.

BY JONATHAN PEREIRA, M. D., F. R. S.

It is well known that both castor and croton oils are remarkable for their great solubility in alcohol, and on this property is founded the usual test for determining their purity and freedom from other fixed oils. For reasons presently to be detailed, I believe this test to be a very fallacious one.

I. When either castor oil or croton oil is mixed with alcohol, the two liquids exercise a mutual solvent action on each other. It is usual to speak of the solubility of castor or croton oil in alcohol, but the solubility of alcohol in these oils is not even alluded to in chemical and pharmacological works. Yet nothing is more easy to prove than that the solvent action is mutual.

Expt. 1.—Sixty-five vols. of English expressed castor-oil were mixed with sixty-five vols. of rectified spirit, sp. gr. 0.838. By shaking, a uniform, clear mixture was obtained.

After several weeks, the mixture had separated into two strata; an upper spirituous one of twelve vols. and an inferior oily one of one hundred and eighteen vols. The supernatent spirit was found to contain oil in solution.

In this experiment, then, fifty-three vols. of rectified spirit must have been held in solution by the castor oil.

Expt. 2.—Eight vols. of pale or amber colored East India croton oil were mixed with eight vols. of alcohol, sp. gr. 0.796, and gently heated. In two days a separation had taken place; the oil now measured eight volumes and three-quarters, while the alcohol measured only seven volumes and a quarter.

In this case the croton oil had taken up three-quarters of a volume of alcohol.

The mutual action of these oils and alcohol appears to me to be similar to that of ether and water. If equal volumes of pure anhydrous sulphuric ether and water be mixed, the mixture on standing separates into two strata; an upper one, consisting of ether holding water in solution, and an inferior one, consisting of water, retaining some ether in solution. The separation of the two liquids by repose, is effected, partly by the difference of specific gravity, and partly by the force of cohesion acting between homogeneous particles.

In the case of spirit, and either castor or croton oil, the phenomena attending the separation are of a very peculiar kind, and require further investigation. By mere shaking without any alteration of temperature, a perfectly clear, transparent, homogeneous liquid is obtained, which by repose becomes (often in a few seconds) cloudy, and in a few hours or days, a separation into two strata of liquids is effected.

II. The mutual action of alcohol or rectified spirit, and either castor or croton oil, is not uniform, but varies with different samples of oil. At first I was inclined to ascribe this variation to differences of purity in the several samples

of oil examined, but I am now convinced this is not the case; and that they depend on other circumstances. To Mr. Herring I am indebted for the means of establishing this fact, as he has supplied me with authenticated specimens of East India castor and croton oils, and of castor and croton oils expressed in his laboratory.

Expt. 3.—Ten vols. of West India* castor oil were mixed with ten vols. of rectified spirit. By shaking, the mixture became clear and transparent. After a few minutes it was hazy, then cloudy and turbid. The tube was immersed in warm water; and the cloudiness disappeared. In eighteen hours the mixture had separated into two clear liquids; an upper spirituous one of three vols. and a lower oily one of seventeen vols.

Expt. 4.—Ten vols. of East India castor oil were mixed with ten vols. of rectified spirit. A cloudy or milky mixture was obtained, which no shaking would render clear; but by immersing the tube in hot water, the mixture became quite clear.

Expt. 5.—Ten vols. of English expressed castor oil were mixed with ten vols. of alcohol; by shaking, a clear transparent mixture was obtained. After a few minutes a haziness began to appear, and in eighteen hours the mixture had separated into two strata, an upper spirituous one of two vols., and an inferior oily one of eighteen vols.

Of the three samples of castor oil examined the English expressed oil was more soluble in alcohol than either of the others.

Expt. 6.—One vol. of dark colored English expressed croton oil was mixed with one volume of alcohol sp. gr. 0.796 by shaking without any additional heat, an uniform

* I am indebted to Mr. Spencer, of Lamb's Conduit Street, for a bottle of this oil. He received it some years ago from the wife of the Governor of Tobago, on whose estate it was procured. Its color is reddish.

transparent mixture was obtained; and no separation took place on standing for several weeks.

In the case of the amber colored East India croton oil a separation takes place on standing, as already stated (see *Expt.* 2.) Here then the solubility of croton oil in alcohol resembles that of castor oil, in the circumstance that both oils obtained by expression in London are more soluble in alcohol than the corresponding oils imported from the East Indies.

On what does this difference depend? Does it arise from the differences in the qualities of seeds pressed, or from differences in the mode of preparing the oil? On these points nothing definite can be stated. In the case of castor oil, the mode of preparation adopted in India is different to that followed in England. Here the oil is expressed in a warm room, and filtered.

An oil presser of Calcutta informed me that, in Calcutta, the expressed castor oil is heated with water, in a tin vessel, until the water boils, by which a scum forms on the surface, and that it is then strained. Dr. Ainslie, however, states that, in Southern India, it is prepared by decoction. In both cases, however, it is heated in boiling water; and it does not appear improbable that heat may effect some change in the oil, or the hot water extract something from it, by which its solubility may be lessened. With a view of elucidating this point, I made the following two experiments:

Expt. 7.—Some English expressed castor oil was heated with water until the water boiled, and the ebullition was continued for several minutes; but no visible change was effected in the mixture. No mucilage, or scum of any kind, separated from the oil, which remained as clear and transparent after the experiment as before. A portion of the oil, when cold, was mixed with an equal volume of rectified spirit, and the mixture shaken up; it in a short time became clear and transparent. The solubility of the oil had

not, therefore, have been appreciably effected by the boiling process.

Expt. 8.—Some English expressed croton oil was heated with water, until the water boiled, and the ebullition was continued for several minutes. No visible change was effected in the oil, and no scum of any kind separated from it. When cold, a portion of the oil was mixed with an equal volume of alcohol, and shaken up; no heat being applied. The mixture became clear and transparent, and no separation had taken place in it at the end of two hours.

As far, therefore, as these two experiments go, they negative the supposition, that exposure to the action of boiling water lessens the solubility of either castor or croton oil in alcohol or rectified spirit.

With the fact of the unequal solubility of different samples of apparently genuine castor oil in rectified spirit, I have long been familiar; but I am indebted to Mr. Redwood for the information that a similar difference exists between the foreign and English croton oils.

In the *Edinburgh Pharmacopœia*, a note is appended to the oil of croton, stating that, when agitated with its own volume of pure alcohol, and gently heated, it separates on standing, without having undergone any diminution. I have never been able to verify this statement. Genuine croton oil, expressed by Messrs. Herring of London, forms, with an equal volume of alcohol, a perfectly transparent mixture, without being "gently heated," and does not again separate at ordinary temperatures. Mr. Redwood has verified the same fact with various samples of genuine croton oil, respectively expressed by himself, by Mr. Morson, by the Messrs. Herring, and by Messrs. May & Co., and he finds that no subsequent separation takes place, unless the mixture be subjected to artificial cold, as a freezing mixture, or to the atmosphere during a very cold night; and in that case the oil is found to have slightly increased in bulk, and the alcohol to have suffered a corres-

ponding diminution of volume. I presume, however, that the statement of the Edinburgh college is intended to apply to the amber colored East India croton oil. This oil, when mixed with an equal volume of alcohol, does not form a transparent homogeneous mixture until a gentle heat is applied, and, on standing, the mixture separates into two strata—thus far agreeing with the statement of the Edinburgh college; but the oil, on separation, is found to have suffered a slight augmentation in bulk, and the alcohol a corresponding diminution (See *Expt.* 2.)

In the degree of its solubility in alcohol, the pale or amber colored East India croton oil agrees with jatropha oil, and Mr. Redwood has suggested that it is perhaps mixed with the latter oil.

It is obvious, from what has been now stated, that if English expressed croton oil were adulterated with castor oil, alcohol would be useless as a test to detect the fraud.

Leopold Gmelin states, in his *Handbuch d. Chemie*, vol. ii., page 458, 1829, on the authority of Stoltze, that benzoic acid promotes the solubility of castor oil in spirit containing seventy-five per cent of alcohol; and I have been informed that camphor is equally efficacious. I have not, however, verified either of these statements.

III. Castor and croton oils enable other fixed oils to dissolve in alcohol. This is a very interesting and important fact; and in illustration of it the following experiments are adduced. I may premise, however, that I have been accustomed for several years to demonstrate the fact in the lecture room.

If rectified spirit be substituted for alcohol a gentle heat is usually required to render the mixture transparent and homogeneous; and on standing the liquid, when cold, separates into two strata, an upper spirituous one holding oil in solution, and an inferior oily one retaining spirit in solution. The relative bulks of the two liquids are, however, very different to those of the spirit and oil originally mixed.

Expt. 9.—One vol. olive oil was mixed with two vols. of rectified spirit. When shaken the mixture remained turbid, and on the application of heat the two liquids separated apparently unchanged.

Expt. 10.—One vol. of olive oil, two vols. of castor oil, and two vols. of rectified spirit were mixed. The mixture remained turbid after shaking; but the application of heat a clear transparent homogeneous liquid was obtained. After some hours separation took place.

Expt. 11.—One vol. of olive oil, and five vols. of rectified spirit were mixed; the phenomena were the same as in the preceding experiment. After some hours separation had taken place.

Expt. 12.—One vol. of olive oil, two vols. of castor oil, and three vols. of alcohol were mixed. By shaking they yielded a perfectly clear, transparent, and homogeneous mixture.

Expt. 13.—One vol. of lard oil (the olein separated from lard by expression) was mixed with one vol. of rectified spirit; after shaking the mixture remained turbid; on the application of heat the oil and spirit separated, apparently unchanged in quantity.

Expt. 14.—One vol. of lard oil, two vols. of castor oil, and two vols. of rectified spirit were mixed. The mixture remained turbid on shaking; but on the application of heat a clear, transparent, homogeneous liquid was obtained. After some hours, however, separation took place.

Expt. 15.—One volume of lard oil, four volumes of castor oil, and five vols. of rectified spirit were mixed. The mixture was turbid after shaking, but became clear, transparent, and homogeneous when heated. Separation, however, took place after some hours.

Expt. 16.—Sixty-seven parts of castor oil and sixty-seven parts of rectified spirit were mixed. By shaking, a clear homogeneous mixture was obtained. In twenty hours no change or separation had occurred. Six vols. of

lard oil were now added, and the mixture well shaken. In a short time, and without the use of heat, a perfectly transparent homogeneous mixture was obtained. On standing, however, fourteen vols. of a spirit, holding some oil in solution, separated.

Expt. 17.—Two vols. of English expressed croton oil, one vol. of olive oil, and three vols. of alcohol, were mixed together. By shaking, a transparent homogeneous mixture was obtained.

In other experiments, which I need not here enumerate, I find that castor oil enables nut oil, (the expressed oil of *Arachis hypogæa*,) jatropha oil, (the expressed oil of *Curcas purgans*,) and anda oil (the expressed oil of *Anda brasiliensis*,) to dissolve in rectified spirit.

The various facts now detailed seem to me to be best explained by supposing that both castor and croton oils, contain some principle which confers on their fatty oil the power of dissolving in alcohol, and that this principle does not exist in all samples of these oils in the same proportional quantity, and hence the different samples are unequally soluble in alcohol. The same principle enables other fixed oils to dissolve in alcohol when they are mixed with either castor or croton oil.

Moreover, if we were further to assume that the quantity of this solvent principle, in both castor and croton seeds, increases the longer the seeds are kept, we should have a ready explanation of the greater solubility of castor and croton oils expressed in England, from seeds brought from India, and which are often musty, than of those oils expressed in India from fresh seeds.

In the *Edinburgh Pharmacopœia* it is stated that castor oil "is entirely dissolved by its own volume of alcohol." The statement is quite accurate; but if it is made as a guide to enable us to determine the purity of the oil, it is perfectly useless, for English expressed castor oil adulterated with

33 per cent. (or in some cases with 50 per cent.) of another fixed oil, dissolved by its own volume of alcohol.—*Pharmaceutical Journal, May*, 1850.

ART. LIII.—ON CANTHARIDIN, AND ITS PHARMACEUTICAL PREPARATIONS.

By Dr. Oettinger.

In 1841 I expressed my opinion that cantharidin is the only constituent contained in the cantharides which possesses blistering power, that the cantharides in substance are, therefore, not all required for blistering, and that a cantharidin taffeta not only fully supplies the place of the Spanish flies, but is even preferable to them.—(*Jahrb. d. ärztl. Ver. in München* III. Jahrg. 1841.) At that time I published a method of preparing a vesicating taffeta, which answered all the technical and dynamical purposes of a blister, and which has been practically substantiated in thousands of cases. The usefulness of this remedy soon manifested itself in Germany by its universal application, but still more by the attempts of apparently improving upon my method of preparation. The proposal of spreading the mass upon paper instead of taffetas, was considered by many not only an essential improvement, but even as a sufficient claim for obtaining a patent.

In the year 1847 I was induced to read to the Medical Society in Munich (*vide* Med. Corresp. Bl. bayer, Aerzte, 1847, p. 813,) and a year after to publish, an account of my experience of this preparation during nine years, and to show that it is perfectly indifferent with regard to the effect, whether the cantharadin be employed in a pure state, or mixed with the green and waxy resin; and whether it be spread on taffetas, linen, or paper. At the same time I also

minutely explained its physiological and therapeutical effect.

In this paper I shall give an account of a solution of cantharidin which serves as the basis of various blistering preparations, and also describe a new vesicating substance containing cantharidin, namely, the *collodium cantharidale.*

Cantharides when treated with ether, yield the *oleum cantharidum viride*—consisting of cantharidin, green oil, and waxy resin; the first, by the separation of the two latter substances, becomes pure cantharidin. This operation, however, is tedious and expensive, and is attended with a considerable loss of active matter, without an augumentation of the blistering power, but with a great increase of price. We employ, therefore, for the purpose of blistering, the *ol. canth. vir.*, which is obtained most easily, and in the greatest abundance by means of ether. This extract readily combines with resins, fat, and collodium, and may be admitted into the Materia Medica under the denomination of *ether cantharidalis seu vesicans.* If applied twice without any admixture, by means of a hair pencil, it produces in children after one or two hours, and if three times applied in adults in three or four hours, abundant blisters, which are treated in the same way as those produced by the ordinary blistering plaster. The other evaporates speedily after the application, and the remaining fixed *oleum cantharidin viride* operates like the cantharides in substance.

Preparation of the ether cantharidalis.

℞ Cantharid. rudit. pulv. part. unam.
Ether. sulphuric. partes duas.
Digere per tres dies et exprime.

In somewhat larger quantity the ol. canth. vir. is obtained by employing Real's press, or the displacement aparatus, (as Ostermyer does here,) or Mohr's apparatus. The preparations composed of *ether canthar.* obtain according to the addition of excipients a different form, namely:

1. *Taffeta vel charta vesicans s. cantharidalis.*

Taffetas (marceline,) stretched on a frame, or paper on a board, is to be painted over twice at proper intervals with an aqueus solution of isinglass; when perfectly dry the liquor cantharidalis—prepared in the following manner, is to be spread over it:

℞ Ether. cantharidalis.
Ether. sulphur. aa. ℥j.
Terebenth coct.
Colophon, aa. ʒ ji.
Misce et solve.

A painter's brush, moderately moistened with the solution, and softly pressed against the brim of the vessel, is then passed at short intervals, and always in the same direction, twice over the stretched material—in twenty-four hours once more—and again after twenty-four hours for the fourth time. In order to prevent the agglutination of the preparation, it is coated after a few days with a fresh solution of isinglass that has already commenced to congeal. The taffeta and the paper are equal to one another in effect, only that the latter is cheaper by a fourth. Before applying the plaster it should be wiped with a wet rag in order to remove the last applied coating of isinglass.

2. *Unguentum vesicans s. cantharidale.*

This ointment, prepared after the Prussian pharmacopœia, is, as I have before stated, indispensable in the treatment of children. After three or four applications it produces within three or four hours abundant blisters, which entirely disappear in a few days. If prepared with equal parts of *ether cantharidalis* and fat, it operates after two or three applications within two hours equally intensely, but quicker and more sure. Half a scruple of *ether cantharidalis* and the same quantity of hogs' lard are sufficient for a threefold application upon a surface as large as a crown piece.

3. *Collodium vesicans seu cantharidale.*

Ether cantharidalis and gun-cotton in substance or solution (collodium) offer a very remarkable vesicant. The ol. cantharid. operates as blister, and the ether rapidly evaporating, the collodium dries within a few moments and forms a coating.

The formula given by Dr. Ilisch in St. Petersburgh, the inventor of the collodium cantharidale, has already appeared in the *Pharmuceutical Journal*, for September, 1849. Its efficacy has been proved by repeated experiments made by Balbiani and Basse.—*Pharmac. Central Blatt*, 1849, No. 7.

These statements I must correct in so far, that by the above-mentioned operation a saturated solution of cantharidin in ether with green oil, and waxy resin—*viz.*, the *ol. cantharidum viride*, is obtained, and not of cantharides; there is also no use in employing acetic ether, since sulphuric ether fully answers the purpose.

Dr. Rapp, who first introduced the collodium cantharidale into Germany, expresses himself in the following manner: "Recently medicinal substances have been combined with collodium for endermic application. This object can only be obtained by volatile substances, which combine with collodium, and readily dry, but which, notwithstanding their volatile nature, are still absorbed under the coating of collodium and act upon the epidermis. Such a substance is cantharidin; this liquid thinly applied with a brush upon any part of the body, dries in a few seconds, and protects this part with a coating like goldbeater's skin. The skin surrounding the periphery of the painted place reddens in children within two or three hours, with adults within five or six hours, accompanied by a burning sensation: gradually the coating, consisting of collodium, rises, and after a few hours a blister is formed, which extends a few lines beyond the whole periphery. On this part, which was not covered with collodium, the blister is opened; the collodium

coating which cannot be removed, remains in its place, and thus protects the sore place, dispensing with the use of ointment." This practical communication of Dr. Rapp deserves to be universally acknowledged.

Ether cantharidalis, prepared after my prescription, is a suitable constituent of all preparations of cantharidin, and is perfectly adapted for preparing the *collodium cantharidalis*. Instead of dissolving gun-cotton in it, I prefer a mixture of equal parts of *ether cantharidalis* and collodium, and rather apply it twice instead of once on the place to be blistered. Since the publication of Rapp's method, I employed it, prepared after my prescription, in about twelve cases, with the best effect. Two scruples of this *collodium cantharidalis* were generally equal to four drachms of the common blistering plaster.

The reason why I have modified Illsch's method of preparing it, is that his preparation is too strong for children, and that the quantity of cantharidin contained in it can neither be increased or diminished, whilst, according to my prescription, the collodium can be added at discretion; and for children I actually took only one part of *ether cantharidalis*, and two parts collodium. Finally, I consider my method preferable with regard to technical purposes; *ether cantharidalis* and collodium are always ready, and the whole does not require to be purposely prepared, and on depending parts of the body the *collodium cantharidale* flows down before it has become dry, and does, therefore, not supply, in this case, the place of taffeta vesicans.—*Pharmaceutical Journal, March* 1, 1850.

ART. LIV.—ON SALEP.

By Dr. X. Landerer.

The enormous quantities of salep root which are every year brought from Macedonia, chiefly from about Janina, to Greece and the whole of the East, induced me to obtain some information respecting this important substance.

In all parts of the kingdom of Greece, but particularly in the plains between Nauplia and Argos, in Messinia many sorts of orchis are found, and amongst these, *Orchis pyramidalis*, on hills in Messenia and Lukonia; *Orchis mascula* on the Parnassus, in Arcadia, in Argolis; *Orchis longiflora* and *O. variegata* in all parts of Morea; *O. undulatifolia* in Messenia; *O. sambucina* in Elis; *O. nigra*, *O. maculata*, *O. conopsea*, in the islands, &c.

From all these species the tubers are carefully collected, but on account of their disagreeable smell and the mucilaginous and unpleasant taste of the decoction, they are very little used, so that only the poorest class of inhabitants gather and employ them for domestic purposes. The Grecian salep is not an article of commerce. Commercial salep comes from Macedonia, from the fruitful valleys and the evergreen mountains about Janina, from Sagona, Tempe, &c.

The species of orchis found in these parts of Epirus, are *O. pyramidalis*, *O. mascula, and O. Morio.* Without the least attention and care having been paid to the culture of these plants, extensive tracts of land and mountains are seen at the commencement of the spring, in the months of February, March, and April, covered to the top with orchis plants. This luxuriance is said to be principally caused by the annual digging up of the soil. The more severe the winter has been, and the snow has covered the mountains during the winter months, the more abundant is the salep crop: it is also stated to have been observed that a larger

consumption of the salep root is followed by a larger produce of it, as the people are thus compelled to turn up the soil, by which the development of the small tubers is much promoted.

After the inflorescence, namely, in April and May, the crop begins, and lasts till August. For this purpose, the soil is turned up to the tops of the mountains, the tubers picked out, and the ground again made flat. The tubers are now repeatedly washed in a running water, and the smaller separated from the larger ones. The first are strung on thread by women and children, and quickly dried in the sun. The tubers which come from these parts to Greece, are scarcely as large as a pea, and are generally of a much darker color than those not strung upon thread, which are sold for double price. These latter are said to retain their white color by being quickly dried in a baking oven, by which they acquire a horny character, which is imparted to them by merely quick drying, and not, as stated in pharmaceutical works, by being previously dipped in boiling water. Whether this immersion is customary in Persia or not, I cannot say with certainty, the *Saleptsides* in Constantinople, who import their salep from Persia, do not mention anything of the kind.

Some roots possess a somewhat saline taste, which proceeds, however, not from their having been dipped in salt water or sea water, but from the soil where they grow, for the various sorts of orchis thrive very well on the coast. The salep imported from Persia, which is sold in the bazaars of Smyrna and Constantinople, and which is at the same time distinguished for its whiteness and corneous appearance, is particularly said to have a very saline taste. In the East, however, where the consumption is greatest, this sort is not liked, and, therefore, the Macedonian kind is preferred.

The collectors pay particular attention to those plants with blue blossoms, as they consider the root to be "the

male salep," which, in their opinion, possesses a greater medicinal power, and is, on this account sold much dearer. When the bulbs are perfectly dry, they are placed in sacks, and sent to the East for sale.

The salep is in great reputation among the Turks as a strengthening medicine, and is used throughout Greece in affections of the bowels and respiratory organs. The decoction of salep, or rather the gelatine salep, is prepared in the following manner by persons who are called in Greece and the whole of the East, *Saleptsides:*—

The salep is ground by means of handmills into a fine powder, then stirred up with water, and boiled into a stiff jelly, which is sweetened with honey. Some Saleptsides add also a small quantity of cyprus root, in order to make it slightly acrid.

After midnight these men go to work, and with daybreak they are heard crying "*Salep! Salep sestom!*" *i. e.* hot salep, which is taken against cough, &c., not only by the poor, but also by others. The salep jelly is carried about in large tin vessels, and kept hot by coals underneath. About eight o'clock in the morning the whole troop of these Saleptsides disappear all at once, and betake themselves to their huts in order to issue again from thence with the following daybreak.—*Pharmaceutical Journal*, March 1, 1850.

ART. LV.—ON A NEW REAGENT FOR DETECTING THE PRESENCE OF SUGAR IN CERTAIN LIQUIDS, AND ESPECIALLY IN URINE.

By M. Maumené.

Several processes have been described by chemists for the detection of sugar, even under the singular circumstances of diabetic disease. Unfortunately none of the pro-

cesses is of such simple execution as to be readily adopted by the medical profession. I now present chemists and physicians with a test-paper, or rather tissue, by means of which the presence of the smallest quantity of sugar can be detected in an instant.

The action of chlorine upon sugar is very imperfectly known, and the experiments which I have made with the endeavor to throw some light upon this question have made known numerous inaccuracies in the statements made by the most celebrated chemists. Thus, whatever M. Liebig may state to the contrary, chlorine acts, even in the dry state, upon sugar; it does not require a temperature of 212° to determine the reaction. At the ordinary temperature it requires more time. In all cases there is formed a brown substance, which is partly soluble in water—a caramel, which is of a brilliant black color when dried. What is obtained with chlorine is obtained as easily, if not more so, with the chlorides, and especially with the perchlorides.

All the sugars behave like cane-sugar towards the chlorides; they all experience this dehydratation, the result of which is the brownish-black product. And this is not all; as might have been foreseen, the substances of analogous composition to that of sugar, and which like it may be represented by carbon and water, equally experience the same kind of alteration. Lignine, hemp, flax, cotton, paper and starch are thus circumstanced.

From these facts we learn the conditions under which we must place ourselves in order to obtain a paper, or rather solid band, coated with a reagent capable of detecting the presence of sugar. Let us suppose, in fact, a slip of solid substance, which is not altered by the chloride of tin even at a high temperature; cover this substance with a layer of chloride by immersing it in a concentrated solution and desiccation; then dip the strip thus prepared in a very dilute solution of sugar, and expose it to a temperature of 266°–300°F. The part which has been immersed will

immediately change color, and will become of a brownish-black more or less deep.

As it is impossible to use paper, linen or cotton, some woollen tissue, for instance a white merino, may be employed. After having dipped the merino for three or four minutes in an aqueous solution of bichloride of tin (the oxymuriate of commerce, $SnCl^2,5HO$,) made with 100 grms. of bichloride and 200 grms. of ordinary water, let the liquid drain off, dry the merino in a piece of the same substance on the water-bath, and the reagent is prepared. It is cut into strips, like the ordinary test papers.

By means of this chlorinated merino, the physician will be able, without the least difficulty, to determine whether the urine of a patient contains an appreciable trace of sugar. It will be sufficient to pour one drop of the urine upon one of these strips, and to hold it over a piece of incandescent charcoal, the flame of a lamp or of a candle, to produce in an instant a very visible black stain. The sensitiveness of the test is enormous; 10 drops of a diabetic urine, added to 100 cubic centimetres of water, furnish a liquid which turns the chlorinated merino completely brownish-black. Ordinary urine, urea and uric acid are not colored by the chloride of tin.—*Chem. Gazette, April* 15, 1850, *from Comptes Rendus,* March 18, 1850.

ART. LVI.—ON THE ADULTERATION OF ISINGLASS.

By Theophilus Redwood, Esq.,

Professor of Chemistry and Pharmacy to the Pharmaceutical Society.

I have recently been engaged in the examination of specimens of some of the isinglass now met with in commerce, which, from the price at which it has been sold, was suspected to be adulterated. The subject, previously to its

being submitted to me, had been, to a certain extent, investigated by Mr. Warrington, of Apothecaries' Hall, whose report to Messrs. Banks and Eland, of Bridge Street, Westminster, on two specimens, one of which was suspected, is as follows:

"*Apothecaries' Hall, April 8th*, 1850.

"Messrs. BANKS and ELAND,

"GENTLEMEN,—I have submitted the two samples of isinglass forwarded me on the 27th ultimo to a careful examination, and beg to report as follows:

"No. 1.—Hand cut, marked Simpson and Humphrey, appears to be a perfectly pure and genuine isinglass, yielding a very firm jelly of good color and quite free from any unpleasant flavor or odor.

"No. 2.—Hand cut, marked Dawson and Morris, on the contrary, is, in my opinion, a very inferior article. It has a great deal of acid adhering to it, which, I consider, must arise either from acid having been used for the purpose of improving the color and appearance of an inferior isinglass so as to render it saleable, or from its admixture with a gelatine which had been prepared by means of an acid; in either case imposing both on the dealer and the consumer. The jelly from this is firm and pretty good in color, but it is acid, has a faint sickly odor, as though the material from which it was made had become slightly putrescent, and the flavor partakes of the same sickly character, which is very disagreeable. Trusting these results will prove satisfactory,

"I remain, yours respectfully,

"ROBERT WARRINGTON."

The suspicion which had been entertained having been thus strengthened, and the nature of the adulteration indicated, it appeared very desirable to have more direct evidence upon the subject, not only with the view of proving a fraud which there was reason to believe was extensively practised, but, at the same time, to enable the dealers in

isinglass to protect themselves and the public against imposition, and to exonerate those who have not participated in this newly discovered branch of the system of adulteration which has become so general. With these views I undertook a few experiments, and although there has not yet been time to complete the investigation, I am induced to publish the results in the hope of their being practically useful.

Of the several varieties of isinglass, which, in the unmanufactured state, are imported into this country, that called *Beluga leaf* is most esteemed for dietetical use, and this, when prepared and cut, constitutes the best Russian isinglass of the shops. There are inferior varieties of Russian isinglass, such as the *Samovey*, which, being much cheaper than the Beluga, may perhaps be sometimes mixed with it when cut, but as the jelly made from such deteriorated specimens would be proportionately weak, the admixture would be thus detected.

Brazilian isinglass is a cheap kind, which is extensively used for fining beer and other similar purposes, and this is also prepared and cut, like Russian isinglass, and is no doubt sometimes mixed with the Russian. The Brazilian variety, however, is much less soluble in water than the best Russian, and the jelly obtained from it is inferior in consistence, in transparency, and in flavor.

When these different kinds of isinglass have been submitted to the processes of the manufacturer, in which they are picked and purified (especially the inferior kinds,) rolled into *ribbons*, and subsequently cut, the prices at which they are sold, wholesale, vary from six shillings to seventeen shillings a pound. The modern introduction of machinery has enabled the manufacturer to prepare the isinglass in much thinner shreds than was formerly the case when it was pulled to pieces by the fingers or cut with the scissors. There are those, however, who still prefer to have it in the thicker pieces, in which state it is called *hand cut*.

The quality of cut isinglass is estimated, 1st, by its color, that which is cut fine by machinery being, *cæteris paribus*, the whitest and generally most esteemed; 2dly, by the smell emitted after breathing upon it, that being the best which is least disagreeable in this respect; 3dly, by the extent of its solubility in water; and, 4thly, by the consistence, transparency, and flavor, of the resulting jelly. This practical method of examination is that alone by which slight shades of difference may be discovered, yet a difference of flavor which only a practised palate, or careful comparison with an approved specimen, could detect, is often important in an article intended for the diet of the fastidious invalid, and a slight superiority in this respect, will, therefore, command a much increased price.

There is no substance that affords so pure and good a jelly as the best Russian isinglass; but gelatinous substances are obtained from other sources, and for several years past have been sold as substitutes for isinglass under the name of *gelatine*. The gelatines of commerce are prepared, either from the skins of animals, or from bones. The jelly made from some of these substances is nearly as firm as that made from isinglass, and although it has more or less of a sickly flavor, sometimes strongly resembling that of glue, yet it must be admitted that the manufacture of gelatine, especially that made from bones, has been greatly improved, so that in color, solubility in water, and gelatinising power, it is almost equal, although in flavor decidedly inferior, to the best isinglass. The sheet gelatine is sold, wholesale, at fifteen pence a pound.

Solutions of good gelatine, and those of isinglass, give similar reactions with the tests usually employed in the examination of gelatinous substances; it became necessary, therefore, to find some characters, other than those usually relied upon, by which to detect the presence of gelatine when mixed with isinglass.

Specimens of the best Beluga leaf and staple isinglass,

uncut, from the museum of the Pharmaceutical Society, and others obtained from the house of Simpson and Humphrey, were used in determining the characters of this substance.

In making the corresponding determination with reference to gelatine, specimens were used of the cut and uncut gelatine, as met with in commerce, including Nelson's opaque and transparent gelatine, and the French gelatine, commonly called *grenatine*.

Action of water on isinglass and on gelatine.—If *cut isinglass* be macerated in cold water, it will assume an opalescent appearance, becoming more opaque than it was previously to its immersion. The shreds, although they swell and soften, will retain their integration. On examining thin slices under the microscope, they present the appearance of a fibrous structure. 2. If *cut gelatine* be macerated in cold water, it will assume a transparent appearance, this effect increasing with prolonged maceration. The shreds will swell up and soften, and ultimately become disintegrated. On examining a thin slice of the softened gelatine under the microscope, it does not present the appearance of a fibrous, but rather of a flaky, structure.

Action of solution of caustic potash on isinglass and on gelatine.—1. If *cut isinglass* be macerated in cold solution of caustic potash (liquor potassæ of the Pharmacopœia,) it will speedily become transparent; and after a lapse of a few hours, if occasionally stirred with a glass rod, it will be dissolved, forming a clear and colorless solution. After allowing the solution to stand for some time, a *very slight* flocculent precipitate will be deposited, which, in operating on twenty or thirty grains of the isinglass, will be scarcely perceptible. 1. If *cut gelatine* be macerated in cold solution of caustic potash it will become opaque; even those specimens which were so, to a certain extent, previously, will assume increased opacity after their immersion. The gelatine will ultimately dissolve, as does the isinglass, but the solution will not be transparent, and after standing for some time, a

very slight flocculent precipitate will be deposited, which, in operating on twenty or thirty grains of the isinglass, will be scarcely perceptible. 2. If *cut gelatine* be macerated in cold solution of caustic potash, it will become opaque; even those specimens which were so, to a certain extent, previously, will assume increased opacity after their immersion. The gelatine will ultimately dissolve, as does the isinglass, but the solution will not be transparent, and after standing for some time, a *copious* flocculent precipitate will be deposited.

Inorganic constituents of Isinglass and of Gelatine.—1. On carefully incinerating isinglass in a platinum crucible, an ash of a *reddish color* is obtained, amounting to .5 per cent., (½ a grain in 100.) This ash consists principally of carbonate of lime. 2. On incinerating gelatine, as above described, a *voluminous white ash* is obtained, amounting to 3. per cent., (3 grains in 100.) This ash, like the former, consists principally of carbonate of lime. Three per cent. is the smallest amount of ash obtained from any of the specimens of gelatine operated upon, but some specimens yield more.

Having thus ascertained that there are several characters, besides those of taste and smell, by which isinglass may be distinguished from commercial gelatine, I proceeded to examine a specimen of isinglass obtained from the same source as that referred to in Mr. Warrington's report, and which was suspected to be adulterated.

1. A portion of the specimen was macerated in cold water. After standing for about two hours, the swelled and softened shreds were examined under the microscope with a low power, and they were found to consist partly of an opaque fibrous substance, resembling genuine isinglass, and partly of transparent flakes, resembling gelatine. In some of the pieces these substances were seen to form distinct strata, running parallel to each other; but in others they were more confusedly interstratified, or the strata completely broken,

and only patches of the transparent part appearing here and there. In some of the pieces the separate strata could be distinctly seen with the naked eye.

2. Some of the specimen was macerated in cold solution of caustic potash. It became less transparent than genuine isinglass would be under similar circumstances. After allowing it to stand for some hours, it dissolved, forming a slightly turbid solution, from which a flocculent precipitate was deposited, which was much greater than that formed in genuine isinglass.

3. Some of the specimen was incinerated; it yielded an ash whiter and more voluminous than that of genuine isinglass, amounting to 1.5 per cent., (1½ grains in 100.) This ash consisted principally of carbonate of lime.

It was evident from these results that the specimen under examination consisted of a mixture of isinglass and gelatine, and the optical examination showed that the two substances had been worked together in a manner well calculated to elude detection. I felt satisfied, and Mr. Warrington had previously expressed the same conviction, that sheet gelatine had been rolled between two sheets of isinglass, in the moistened state, so as to form a ribbon, in which the two substances would be united.

In order to get further evidence in confirmation of this view, I applied to Mr. Vickers, proprietor of the house of Simpson & Humphrey, of Little Britain, who is an extensive manufacturer of cut isinglass, and who having been a sufferer from being undersold by the manufacturers of the adulterated article, expressed a willingness to render me any facility that his manufactory could afford for elucidating the subject. I accordingly had some genuine isinglass and sheet gelatine in the proportion of three parts of the former and one of the latter, rolled into ribbon and cut, under my inspection. The specimen thus prepared could not be distinguished by the eye from the best Russian isinglass. It agreed entirely with the adulterated article met with in commerce,

not only in appearance, but in the characters presented when examined in the manner already described.

I feel fully justified therefore in the conclusion I have drawn, that a most ingenious but unwarrantable system of adulteration is adopted in the manufacture of cut isinglass, and I trust that this exposure will enable those who deal in isinglass to detect the imposition, if its practice should be continued.—*Pharmaceutical Journal, May*, 1850.

ART. LVII.—ACTION OF NITRIC ACID ON RHUBARB; AND PRODUCTION OF A NEW COLORING MATTER, ERYTHROSIN.

By M. Garot.

On adding four parts of nitric acid to one part of coarsely-powdered rhubarb, in a wide-mouthed, stoppered bottle, a brisk reaction speedily takes place, accompanied by the disengagement of nitrous gas, elevation of temperature, and swelling up of the mixture. This reaction commences almost immediately with indigenous rhubarb, but less energetically with the foreign varieties. A temperature of from 60° to 70° Fah., however, is necessary to commence the action.

After leaving the ingredients in contact for two days, the foreign rhubarb acquires a pulpy consistence and orange yellow color, the acid being almost entirely absorbed by the solid residue. The indigenous rhubarb, on the other hand, assumes the condition of a bright chrome-yellow pulp, floating on an acid liquor.

On diluting the mixtures with a large quantity of water, straining through cloth, washing, pressing, and drying the solid residues, there remains from the indigenous rhubarb, a bright yellow, and from foreign rhubarb, an orange-

colored powder. Indigenous rhubarb yields from 8.5 to 10 per cent., and foreign rhubarb from 15 to 20 per cent. of this product.

The author proposes the name *Erythrosin* for this product, in consequence of the property it possesses of being reddened by alkalis.

Properties of Erythrosin.—After being dried, erythrosin is in the form of a yellow or orange agglomerated powder, which acquires a shining appearance on being pounded in a mortar. It is perfectly tasteless; the odor slightly aromatic and nitrous, arising probably from the presence of a little nitrous acid in combination, which washing will not remove.

Action of Heat.—When exposed to the action of heat in a glass tube, abundance of yellow vapors of rhabarbaric acid are given off, which condense into a yellow crust on the sides of the tube, and leave a white residue of lime, which is more abundant in the erythrosin from foreign than from indigenous rhubarb.

Action of Water.—Cold water has but little action on erythrosin, merely acquiring a slight yellow color; but if it be boiled, the liquid acquires a reddish amber color, and becomes slightly acid. This acidity appears to arise from the presence of a little nitric acid, not previously removed by the washings; for it cannot be attributed to rhabarbaric acid, the quantity of which is so small, as scarcely to redden potash. When evaporated to a certain extent, the liquor deposits a gelatinous matter having all the characters of pectin.

Action of Alcohol.—Cold alcohol has little action upon it: it acquires an amber color, which becomes deeper on the application of heat, and finally assumes the reddish-yellow color of Malaga wine. After treating it seven or eight successive times with boiling spirit, all soluble matter is removed, and the solutions all redden litmus paper.

On evaporating the alcoholic solution, a yellow flocculent

deposit is formed, together with a crystalline pellicle over the surface; but no crystals are deposited on cooling. A dry product is obtained by evaporating all the spirit away, and this is in the form of a granular powder of a brownish yellow color, having some resemblance to Spanish tobacco. It has a slightly aromatic odor, and a mucilaginous and slightly acid taste, quite different from that of rhubarb.

This substance is entirely dissolved by repeatedly treating it with hot alcohol. On evaporating the solution, a granular substance of a sulphur yellow color is obtained, the surface of which acquires an orange tint, from exposure to the air.

This substance possesses all the physical and the principal chemical characters attributed by Brandes to rhabarbaric acid, and by Geiger to rhabarbarine.

The erythrosin of indigenous and of exotic rhubarb afford products which are perfectly identical, excepting that that of indigenous rhubarb yields a larger proportion of the rhabarbaric acid.

Erythrosin of indigenous rhubarb yielded :—

Rhabarbaric acid	85.0
Insoluble matter	15.0
	100.0

Erythrosin of exotic rhubarb yielded :—

Rhabarbaric acid	60.0
Insoluble matter	40.0
	100.0

Action of Ether.—From the action of Ether on the substance dissolved by alcohol, it might be inferred that it is a perfect solvent for rhabarbaric acid. It exhausts erythrosin entirely of that principle when aided by the application of heat.

Action of Alkalis.—When erythrosin is brought into contact with the alkalis, it immediately acquires an intense

purplish-red color. It is this combination which is most deserving of attention, on account of the beauty of the color produced, which may probably admit of application in the arts.

If one part of caustic potash be added to two parts of erythrosin, and thirty parts of water, a purplish-red solution will be obtained, which will have acquired its full intensity of color after standing for a few days. After filtering the liquor through cotton, it may be kept for a month without alteration, and may be used as a coloring agent. In fact, one part of erythrosin will thus afford as much color as six parts of cochineal. If a few drops of the alkaline solution be added to a piece of chalk or magnesia, it will be absorbed, and will form a rose-colored powder, as bright as if colored with carmine.

Erythrosate of Ammonia, after driving off the excess of ammonia, possesses the same properties as the potash salt; but its coloring power is more than four times greater. It may be advantageously used for coloring soaps, and for other similar purposes.—*Pharmaceutical Journal, May, 1850, from Journal de Pharmacie.*

ART. LVIII.—ON THE FORMATION OF ASPARTIC ACID FROM BIMALATE OF AMMONIA.

By M. Dessaignes.

We are indebted to M. Piria for the knowledge of the interesting fact, that asparagine and aspartic acid, submitted to the oxidizing action of nitrous gas, disengage nitrogen, and leave a residue of malic acid. He thus demonstrated by analysis that these two substances may be considered as amides of malic acid, corresponding for instance to oxamide and oxaminic acid. If this be the case, we ought to be able to reproduce asparagine and aspartic acid by synthesis.

The action of ammonia upon malic ether, when a method shall have been discovered for preparing this ether, ought to produce asparagine. I have not been more fortunate than my predecessors in my endeavors to obtain malic ether; but I have succeeded in preparing aspartic acid from, the bimalate of ammonia.

When this salt is heated to between 320° and 392° in an oil-bath, it melts, puffs up, and disengages some slightly ammoniacal water. The residue is a transparent, resinoid, reddish mass, which dissolves but very sparingly even in boiling water. By repeated washing with hot water, an amorphous pulverulent matter, of a pale red color and an earthy taste, is obtained. It is a new nitrogenous acid, differing in all its reactions from aspartic acid. It is a very stable substance, and dissolves in hot concentrated acids, from which it is precipitated by an addition of water unaltered, even after ebullition, for some minutes. But if heated for five or six hours with nitric or hydrochloric acid, it undergoes a remarkable metamorphosis. The reaction is terminated when water added to the acid solution no longer causes a precipitate. The solution, evaporated to dryness in the water-bath, left a brown, very acid, crystalline residue, which is a combination of hydrochloric acid and an organic substance. This compound is readily purified by means of charcoal, and is obtained in beautiful colorless crystals. It was dissolved in a pretty large quantity of boiling water, and the solution divided into two equal parts one of which was accurately saturated with ammonia, and the other part then added. On cooling, a quantity of minute brilliant prisms separated, which are aspartic acid. This acid does not exhibit the same crystalline form as the aspartic acid derived from asparagin; but the salts which it forms with lime, soda and the oxides of copper and silver crystallize with the same form as the corresponding aspartates; and I have convinced myself by analysis that they contain the same amount of base. I have also submitted

the isolated acid to direct analysis, and have obtained the same numbers as those furnished by the combustion of aspartic acid.—*Chemical Gazette, April* 15, 1850, *from Comptes Rendus, March* 18, 1850.

ART. LIX.—ON THE PURIFICATION OF DRINKING WATER.

Of the various important topics which have been brought under discussion in connection with the metropolitan water supply, not the least important is that which relates to the depuration of the water furnished by the several companies to the inhabitants of this great metropolis. We propose, therefore, on the present occasion, to take a general survey of the various possible methods of effecting the purification of water, and then to consider which of them are practicable and necessary to be adopted by the metropolitan water companies.

Water may be purified by *subsidation and decantation*, by *filtration*, by *ebullition*, by *distillation*, by *clarification* or *fining*, and by the *addition of certain chemical agents*, which effect a chemical change in the composition of the fluid. Of course some of these methods are practicable on the large scale, but it appears to us to be desirable to examine the whole subject, and to notice also those which, though not applicable to public companies, have been, or still are, practised by individuals on the small scale.

1. *Subsidation and Decantation.* The depuration of water is greatly aided by repose, by which various suspended or mechanical impurities are allowed to subside gradually, and from these the supernatant water is drawn off. Tanks, cisterns, and reservoirs become, therefore, important depurating agents. All the metropolitan water companies are provided with large deposite reservoirs in which this form of purifica-

tion goes on; and most houses are supplied with tanks, cisterns, or water-butts, which may be regarded as deposit reservoirs on a small scale.*

The purification of water by subsidation and decantation is the simplest of all modes of depuration; but unfortunately it is a very slow one. M. Leupold states that the water of the Garonne, taken when the river is swollen, does not recover its natural limpidity by ten days of perfect repose. The coarser impurities very quickly subside; but the finer matters are deposited very slowly.

During the time that deposition is going on, the water is exposed to the atmosphere, and in consequence suffers some chemical change. The bi-carbonate of lime, which it holds in solution, undergoes decomposition, half of its carbonic acid is evolved, and chalk or simple carbonate of lime deposited.

$$\underbrace{Ca\,O, 2\,CO_2}_{\text{Bi-carbonate of lime.}} = \underbrace{CO_2}_{\text{Carbonic acid.}} + \underbrace{Ca\,O, CO_2}_{\text{Chalk.}}$$

In this way the atmosphere aids in softening those waters which owe the whole or part of their hardness to bi-carbonate of lime. The atmosphere, however, is a source of contamination, as well as of purification. This must be very apparent when we take into consideration the immense quantity and variety of foreign bodies, inorganic as well as organic, contained in it. Ehrenberg tells us that, exclusive of inorganic substances, he has detected no less than 320 species of organic forms (*Polygastrica*, *Pytolitharia*, *Polythalamia*, and soft vegetable parts) in the dust of the winds; and it is obvious, therefore, that waters which are chemically very pure, would become contaminated by a prolonged retention in the deposit reservoirs.

* Sir William Clay says, that there cannot be less than from 30,000 to 40,000 cisterns in the district supplied by the Grand Junction Water Company.

By those who advocate the superiority of a continuous over an intermittent supply of water, the inconveniences and expense of cisternage have been forcibly pointed out; and it has been argued that by the adoption of a constant supply, the necessity of reservoirs in private houses would be got rid of. This, however, is a fallacy. Cisterns or other reservoirs would still be required, on account of the inevitable interruptions of supply arising from repairs to the mains and service pipes, alterations, extensions, and other causes. At the present time these are sufficiently numerous and annoying;† but they would in all probability be considerably augmented if the mains and service pipes were kept constantly charged; as the bursting of pipes from frosts would then be of more frequent occurrence; and the slightest repair to a service pipe would require the interruption of the supply to a street, or, perchance, to a district.

Moreover, in the cases of those companies which do not filter the water they supply, house cisterns are absolutely required as deposit vessels, as the water furnished is occasionally turbid and muddy, and quite unfit for immediate use. This statement applies to the New River Water, which is one of the best of the unfiltered Metropolitan waters. Although it is conveyed many miles by an acqueduct, which to a certain extent may be regarded as a deposit reservoir, and is afterwards allowed to deposit in the proper reservoirs at the company's works, yet at certain seasons, as after heavy rains, the water supplied by the company is very turbid, and does not recover its limpidity after two or three days' retention in the house cistern.

2. *Filtration.*—This process has for its chief object the

† The total number of interruptions which occurred in the year ending September 30, 1849, to the tenants of the Grand Junction Water Company was 2316, being an average of 6. 34 per day, Sundays included. The average time during which the water was shut off was from half-an-hour to six hours, according to the character of the works required.

separation of the mechanical impurities of water; that is, of those foreign bodies which are suspended, not dissolved, in water. But under certain circumstances, filtration becomes a means of modifying the chemical composition of water. Between liquids and solids there exists that kind of attractive force commonly called *adhesion*, to which are due the phenomena of capillarity or capillary attraction; and under certain circumstances, this adhesive force is capable of overcoming a feeble chemical force, and thereby of effecting the decomposition of bodies whose constituents are held together by weak affinities. Practically, however, filtration is in most cases to be regarded as a mechanical process, by which physical and not any important chemical changes are effected.

The materials employed for the filtration of water are perforated plates of metal or stone-ware, unsized or bibulous paper, flannel or cloth or other tissues, sponge, porous stone (filtering stone,) charcoal (animal charcoal,) and beds of sand and gravel.

On the present occasion we shall confine our attention chiefly to those which are applicable to the filtration of water on the large scale, namely, beds of sand and gravel; but we shall premise a few observations on the use of animal charcoal as a filtering material.

Of all the permeable substances used for the purpose of filtration, animal charcoal possesses in the highest degree the combined mechanical and chemical influence to which we have already referred. In addition to its power, in common with other filtering media, of removing suspended or mechanical impurities, it also abstracts from the liquor which permeates it, various dissolved bodies, and thus effects a change in the chemical composition of the fluid which traverses it. Thus it removes odorous and coloring matters, bitter principles, vegetable alkaloids, resins, tannin, and even metallic substances, from their solutions. By filtration through it the most stinking ditch water may be deprived of its noxious odor and flavor, and highly colored solutions,

such as wines and other brown saccharine liquids, are rendered colorless by it.

These important properties of animal charcoal have oftentimes led to its recommendation and use as a filtering medium for water; and accordingly it is introduced into many of the common domestic water filters. But its deodorizing and decolorizing power is soon lost, and in order to enable it to reacquire its former efficacacy, it requires to be again burned. Sugar refiners are obliged to renew weekly the animal charcoal which they employ for the decolorization of brown syrups. So that when employed in water filters, animal charcoal requires renewal every week or two.

Of all known permeable substances, the only ones which present all the requisites of filtering media for water on a large scale, are sand and gravel. These are cheap, allow the passage of water through them, and, when they have been previously well washed, communicate no impurity to the waters which traverse them. Their employment must have been suggested to man by the observation of the numerous limpid springs which arise in sandy and gravelly districts.

Their action is chiefly, if not entirely, mechanical. They possess little or none of that power of effecting chemical changes on the liquids filtering through them, which, as we have before remarked, animal charcoal possesses in so preeminent a degree. Yet, unless several distinguished writers have grossly deceived themselves, sand is not entirely devoid of this chemical influence.

Wagenmann, for example, found that when vinegar is filtered through pure quartz sand, the first portion of liquid that runs through is deprived of almost all its acid, and the vinegar does not pass through unchanged until the sand has become well charged with acid. The same authority also states that potato-brandy diluted with water and filtered through quartz sand, yields at first pure water, then a mixture of water and alcohol deprived of its fusel-oil, and, lastly, the original mixture unaltered.

Berzelius filtered a saline solution through a long tube filled with sand, and found that it ran out more or less completely deprived of salt.

Matteucci repeated Berzelius's experiment and confirmed his statement. He filled a tube about twenty-six feet long with sand, and filtered a saline solution through it, and he found that the density of the liquid introduced by the upper aperture of the tube was to that of the liquid escaping from the lower end as 1.00 to 0.91. But he observed that this difference of density was not always maintained; for after a certain time the saline solution becomes as dense at its exit from, as its entrance into, the tube; proving that the decomposition of the saline solution takes place in the first action of contact between it and the particles of sand.

But a still more remarkable result, the inverse of the one just stated, was obtained by the last mentioned author with a solution of carbonate of soda. He filled a tube, nearly ten feet long, with sand, and filtered a solution of carbonate of soda through it; and he found that the density of the liquid at its entrance was to that at its exit as 1.000 to 1.005. In this case then the sand had deprived the solution of part of its water, and had thereby increased the gravity of the liquid which filtered through.

Assuming, however, the accuracy of all these reported observations, it cannot be doubted that, in a practical point of view, the efficacy of sand, as a filtering medium, depends on its mechanical, not on its chemical influence.

Domestic water filters are usually made of stone-ware, and usually contain a combination of filtering materials—such, for example, as sponge, sand, and charcoal.

The filter beds used by several of the metropolitan water companies consist of a number of layers of sand and gravel, resting on perforated drains or tunnels. They will be more fully noticed hereafter.

3. *Ebullition.*—Boiling effects the expulsion of air and carbonic acid from water. It decomposes the bi-carbonate

of lime; carbonic acid gas being given out, and chalk or simple carbonate of lime precipitated. The fur which lines the tea-kettle, and the incrustation on the interior of steam-boilers, are chiefly composed of chalk. Lastly, ebullition destroys the vitality of either vegetable or animals found in water.

4. *Distillation.*—When properly conducted, distillation is the most effectual method of effecting the purification of water. But as it is manifestly not applicable to the purposes we have in view, it will not be necessary to enter into details respecting this mode of purifying water.

5. *Clarification, Clearing, or Fining.*—Under this head, we propose to notice certain methods of removing, from muddy water, those floating or suspended impurities which render it turbid or opaque. The methods in question are essentially mechanical processes, and are somewhat similar to the fining or clarifying processes used for wine and beer.

It is well known, that the finings used for beer and white wines are of a gelatinous nature; but for red wines, as well as for some other liquids, white of egg (an albuminous substance) is used.

In some semi-barbarous countries, muddy water is cleared or fined, and hereby rendered fit for drinking, by rubbing the the inside of the earthen vessel containing the water with some kind of seeds, and then putting it aside, so as to allow the impurities to deposit, and from these the supernatent clear water is decanted.

In India, the seeds of *Strychnos Potatorum* or *Clearing Nuts*, are used for this purpose. The fruit of this plant is a shining berry, about the size of a cherry, and, when ripe, is black. It contains one seed, which is about the size of a cherry-stone.

"The ripe seeds," says Dr. Roxburgh, "are dried, and sold in every market to clear muddy water. The natives never drink clear well water if they can get pond or river water, which is always more or less impure, according to circum-

stances. One of the seeds is well rubbed for a minute or two round the inside of the vessel containing the water, generally an unglazed earthen one, which is then left to settle, In a very short time the impurities fall to the bottom, leaving the water clear, and so far as I have been able to learn, perfectly wholesome. These seeds are constantly carried about by the more provident part of our officers and soldiers in time of war, to enable them to purify their water. They are easier to be obtained than alum."

Dr. O'Shaughnessy suggests that the clearing action depends on astringency in the fruit. But even if there were an astringent principle present, it would not account for the effect. We believe the efficacy depends on the presence of albumen and casein in the seed, which act as fining agents, like those employed for wine and beer. If the seeds be sliced and digested in water, a thick, mucilaginous ropy liquid is obtained, which, when boiled, yields a coagulum. If this be removed, a further coagulum is obtained, by the addition of acetic acid. These reactions show the presence of albumen and casein.

If this opinion be well founded, many other seeds ought also to have a similar influence; and this really appears to be the case. Thus we are told that, in order to clarify the muddy waters of the Nile, the natives of Egypt rub the inside of earthen jars, in which the water is kept, with almonds prepared in a particular manner. The water is then strongly agitated, and afterwards covered, and allowed to remain at rest for four or five hours, at the end of which time the impurities have subsided, and the supernatant clarified water is decanted.

Niebhur says bitter almonds are used; but Dr. Arcet states that either bitter or sweet almonds may be employed. They are peeled, and made into cakes as large as eggs.

At Sennaar and Dongola, in Nubia, beans, haricots, and even castor seeds are also used for clearing the water of

the Nile. We have no doubt that the efficacy of all these seeds in clearing water depends on the albumen and casein which they contain.

6. *The addition of Chemical Agents.*—This head includes several proposed methods of purifying water, which consist in the addition of certain chemical agents to this liquid, by which its composition is altered.

a. Addition of Alum.—In England as well as in France a popular method of clearing muddy water is to add a few grains of powdered alum to it (two or three grains are usually sufficient for a quart of water.) This process our neighbors call the *alunage de l'eau;* and Arago states that when practised on the Seine water it causes the mud to agglomerate in long thick striæ which are very quickly deposited. The theory of the process appears to be this: the alum decomposes the bi-carbonate of lime, and gives rise to the formation of sulphate of lime, which, with sulphate of potash, remains in solution, while carbonic acid is evolved, and hydrate of alumina being precipitated in a flocculent form, carries with it various mechanical impurities.

$$\underbrace{KO,SO_3 + Al_2O_3,3SO_3}_{\text{Alum (dry)}} + \underbrace{3(CaO,2CO_2)}_{\text{Bicarbonate of lime.}} = \underbrace{6\,CO_2}_{\text{Carbonic acid.}} + \underbrace{KO,SO_3}_{\text{Sulphate of potash.}} + \underbrace{3(CaO,SO_3)}_{\text{Sulphate of lime.}} + \underbrace{Al_2O_3}_{\text{Alumina.}}$$

This process then is a kind of mechanico-chemical one. It clears the water, but at the same time alters its chemical composition, and by converting bi-carbonate into sulphate of lime augments the hardness of the water.

b. Addition of Caustic or Carbonated Alkalies.—Caustic alkalies added to water holding in solution bicarbonate of lime, saturates the excess of carbonic acid, throws down carbonate of lime (chalk,) and leaves an alkaline carbonate in solution. If soda be the alkali used the result will be as follows:

$$\underbrace{CaO, 2\,CO_2}_{\text{Bi carbonate of lime.}} + \underbrace{Na\,O}_{\text{Soda.}} = \underbrace{Na\,O, CO_2}_{\text{Carbonate soda.}} + \underbrace{CaO, CO_2}_{\text{Chalk.}}$$

If an alkaline carbonate be employed, all the earthy salts (calcareous and magnesian sulphates, chlorides, and bi-carbonates,) carbonates of the earths, are precipitated, while alkaline sulphates, chlorides, and bicarbonates which do not communicate hardness to water, are left in solution. If carbonate of soda be employed, its reaction on sulphate of lime and chloride of magnesium will be as follows:

$$\underbrace{CaO,SO_3}_{\text{Sulphate of lime,}} + \underbrace{MgCl}_{\text{Chloride of magnesium.}} + \underbrace{2(NaO,CO_2)}_{\text{Carbonate of soda.}} = \underbrace{NaO,SO_3}_{\text{Sulphate of soda.}} + \underbrace{NaCl}_{\text{Chloride of sodium.}} + \underbrace{CaO,CO_2}_{\text{Carbonate of lime.}} + \underbrace{MgO,CO_2}_{\text{Carbonate of magnesia}}$$

c. Addition of Lime.—A few years ago Professor Clark of Aberdeen took out a patent for the purification of water. His process consists in the addition of caustic lime to water; by which the bi-carbonate of lime held in solution is decomposed: the caustic lime saturates the excess of carbonic acid, and forms carbonate of lime, which is precipitated.

$$\underbrace{CaO,2CO_2}_{\text{Bi-carbonate of lime.}} + \underbrace{CaO}_{\text{Caustic lime.}} = \underbrace{CaO,CO_2}_{\text{Carbonate of lime.}}$$

We believe Clark's process to be virtually impracticable on the large scale, while its efficacy is but slight..

It must be remembered that this process affects the bi-carbonate of lime, not the more troublesome earthy salts, such as the sulphates and chlorides, on which the hardness of spring waters mainly depends. The difficulty of mixing lime and water in definite proportions, on the large scale, must be obvious to every one. If too much be employed the companies would furnish their customers with lime-water! If too little, the bi-carbonate of lime would not be completely destroyed, and the process would be a failure. Altogether the difficulties of carrying out the process are such that we believe it to be impracticable for water companies.

But the advantages of the process have been greatly exaggerated. The calculation of the patentee that, by the adoption of his process, the metropolis would annually save

£63,000 (being ten per cent. on the estimated value of the soap and soda consumed) is, we believe, all moonshine. The washing of clothes, as practised by our metropolitan nymphs, is usually affected by hot, not by cold water; and as by boiling, the same softening effect is produced on water which Professor Clark proposes to obtain by his patent process, the London washerwomen already adopt as good a process without the payment of anything for the use of a patent.

Lastly, the complaints made respecting the quality of the water supplied by the metropolitan companies apply to the organic matter chiefly, rather than to the earthy salts. For though Thames water contains on an average about fourteen per cent. of calcareous salts, yet the greater part of this is bi-carbonate of lime, which by boiling is decomposed as explained above. Now, as in washing, brewing, tea-making, &c., the water is usually boiled before it is used, the inconvenience produced by the bi-carbonate is but little felt; and the real complaints relate to the suspended or mechanical impurities, and to the dissolved organic matter.

d. Addition of Oxalate of Potash.—Mr. Horsley, a respectable Pharmaceutical Chemist of Ryde, Isle of Wight, has taken out a patent for a new method of preventing incrustations in boilers, and also for purifying, filtering and otherwise rendering water fitter for drinkable and other purposes. When sea water is employed for generating steam, he purifies it by employing oxalate of potash and ammonio-phosphate of soda; and the proportions which he employs for the water of the British Channel are about two drachms of oxalate of potash to about two ounces of the ammonio-phosphate of soda for every gallon. When his object is to purify and soften hard water he employs such substances as are capable of decomposing the calcareous salts, such as calcined or caustic baryta, or baryta water, phosphate of soda, silicate of potash, oxalic acid or the oxalates, and caustic strontia, or strontia water; but he

gives the preference to oxalate of potassa. He first ascertains the degree of hardness of water, and then adds the requisite quantity of oxalate of potassa, by which an oxalate of lime is precipitated, and there remains in solution, instead of the lime displaced, a carbonate, sulphate of potash or chloride of potassium, as the case may be, and the water is purified and fit for use.

The following equation explains the reaction of oxalate potash (we assume the salt to be neutral) on bi-carbonate of lime:

$$\underbrace{CaO,2CO_2}_{\text{Bicarbonate of lime.}} + \underbrace{CaO,SO_3}_{\text{Sulphate of lime.}} + \underbrace{2(KO,Ox)}_{\text{Oxalate of potash.}} = \underbrace{2(CaO,Ox)}_{\text{Oxalate of lime.}} + \underbrace{KO,2CO_2}_{\text{Bicarbonate of potash.}} + \underbrace{KO,SO_3}_{\text{Sulphate of potash.}}$$

Mr. Horsley's patent process does that which Professor Clark's fails to do: it decomposes all the earthy salts on which the hardness of water usually and mainly depends. But it is open to still greater objections than those that have been raised to the other method. Besides being like Clark's process virtually impracticable, it would prove very expensive, and as regards the metropolitan river waters it is quite unnecessary. Moreover the idea of "physicking" or "doctoring" the water by the addition to it of a poisonous agent, would, if even no other objection existed to this scheme, be quite fatal to it. For though in the hands of competent persons like Mr. Horsley, no possible injury could arise from its use, yet the public would always have some suspicion of water thus treated; and as a certain English engineer once observed to Arago, "*Water, like Cæsar's wife, should be above suspicion.—Pharmaceutical Journal, April* 1, 1850.

ART. LX.—ON PAPAVERINE.

By G. Merck.

The name papaverine has been assigned by the author to the new and well-characterized alkaloid discovered by him some short time ago in opium. According to the following investigation, its composition is represented by $C^{40} H^{21} NO^8$.

It is obtained by precipitating the aqueous extract of opium with soda, exhausting the precipitate with alcohol, and evaporating to dryness the brown tincture obtained. The residue is treated with dilute acid, the liquid filtered and precipitated by ammonia, when a resinous matter is obtained which contains the papaverine.

To procure it in a pure state, the resinous matter is dissolved in dilute muriatic acid, and mixed with acetate of potash. Another resinous precipitate is obtained, which after being washed with water is treated with boiling ether. From this solution the papaverine crystallizes on cooling.

This alkaloid may be prepared in a still more simple manner from the first dry resin. When mixed with its weight of alcohol, a smeary syrupy mass is formed, which on standing for several days at a temperature of 88° F. congeals to a paste of crystals. This is strongly pressed, and purified by recrystallization from alcohol and digestion with animal charcoal. The papaverine is treated with hydrochloric acid, to remove some narcotine which it still contains, and set aside to crystallize, when the sparingly-soluble readily-crystallizable hydrochlorate of papaverine separates, and the whole of the narcotine can now be removed by washing with cold water.

Papaverine separates from alcohol in a confused tissue of white acicular crystals, which are sparingly soluble in cold alcohol and ether, dissolve more abundantly on the appli-

cation of heat, and separate again on the cooling of the solutions. It is insoluble in water. The solutions of papaverine turn slightly-reddened litmus-paper blue. When moistened with concentrated sulphuric acid, it acquires a dark blue color, by which it is easily recognized.

The papaverine used for analysis was prepared from the pure muriate, which had crystallized from the aqueous solution, by dissolving it in hot water, precipitating with ammonia, and crystallizing the precipitate from alcohol. The analysis furnished—

Carbon - -	70.68	70.47	70.62
Hydrogen - -	6.65	6.32	6.65
Nitrogen - -			4.75

These numbers, with the assistance of those obtained in the analysis of the platinum double salt, lead to the following formula for papaverine:—

				Mean of Experiments.
Carbon - - -	70.59	40 = 240		70.79
Hydrogen - - -	6.50	21	21	6.20
Nitrogen - - -	4.75	1	14	4.13
Oxygen - - -		8	64	18.88

Chem. Gaz. March 15, 1850.

ART. LXI.—ON THE RESIN OF THE NORWAY SPRUCE FIR. (ABIES EXCELSA.)

By Mr. Daniel Hanbury, Jun.

In the Materia Medica of the London Pharmacopœia, two forms of the resin of the Norway Spruce Fir (*Abies excelsa*) are enumerated: one *Abietis resina*, called Common Thus or Frankincense; the other, *Pix Abietina* or Burgundy pitch. The latter is stated to be the resin in a prepared state (*Resina præparata*,) the preparation essentially consisting in the removal of the impurities by straining.

The first of these substances, viz., *Abietis resina*, is rare in English commerce, and it was not until during a recent visit to Switzerland, that I had an opportunity of obtaining an authentic specimen. In many parts of that country this species of *Abies* is very abundant, forming extensive and beautiful tracts of forest. The resin exudes spontaneously from fissures in the bark of the tree, and especially from those places where branches have been broken off. When it first issues, it is sometimes quite transparent and liquid, but is more commonly found opaque, and of a pale yellow color and soft consistence. By exposure to the air, it hardens and becomes of a browner tint. Some of the hardened tears are internally white and opaque, like drop ammoniacum, the broken surface acquiring a pink hue by exposure to the air. The odor is peculiar, terebinthinate, cheesy, and rather aromatic; the taste slightly bitter.

The article now sold as *Abietis resina*, is believed to be imported chiefly from America, and in odor and color much resembles common American turpentine hardened by age. It usually occurs in large agglutinated masses, whose surfaces when long exposed become transparent, brittle, and of a deep yellow color. Internally, they are soft and opaque, pale yellow marbled with whitish patches. The odor is that of common American turpentine, though not so powerful. Some of this resin appears to have exuded spontaneously, and contains such impurities as small chips of wood, sticks, leaves, &c. The leaves are evidently not those of the Norway spruce fir.

When genuine *Abietis resina* is melted in hot water, strained and cooled, we obtain Burgundy pitch, as a very pale, yellowish brown substance, almost entirely soluble in cold alcohol, easily softening in the hand, and having a peculiar, agreeable, aromatic odor. Burgundy pitch, apparently genuine, is imported from Hamburgh in tubs called *stands*, each containing about one hundred pounds, but it is usually in so impure a state as to require straining, some-

times a rather difficult process involving considerable loss. It is moist, of a greyish buff color speedily becoming dark on the surface by exposure to the air; when strained it acquires a browner hue, and is very adhesive. It was formerly called Rhine pitch, to distinguish it from another imported variety now seldom seen, which was designated Baltic pitch.

Baltic pitch is a brittle resin, externally transparent, and of a bright yellowish brown color, internally pale buff, and very opaque. Its odor is slight but agreeable, though wanting the peculiarity of that of genuine Burgundy pitch. I know not its botanical origin.

Artificial Burgundy pitch, apparently intended as an imitation of the sort last described (since it strikingly differs from the Hamburgh or genuine sort) is manufactured in London and elsewhere, and is sold in bladders, as a clear brittle resin, very moist, of a fine orange yellow color, and having but little odor and taste. It does not completely dissolve in cold alcohol.

Other varieties of spurious Burgundy pitch are employed on the continent, but as they do not occur in English commerce, it seems unnecessary to describe them.—*Pharmaceutical Journal, March*, 1850. *By the Editor.*

ART. LXII.—ON AMALGAMS FOR STOPPING TEETH.

By Arnold Rogers, Esq.

I have much pleasure in communicating, through the Pharmaceutical Society, a few remarks on amalgams, as well as the formula for the one I have used for some years; and although occasionally some specimens have come under my observation, which seemed to possess qualities superior to the general character of amalgams, yet, on the

whole, I have been satisfied with my own compound. Not but that I think it may be improved upon; and, when leisure time will allow me, I shall endeavor to profit by the hints and communications of my professional brethren.

It should be thoroughly understood, that whenever gold foil can be used, it ought to be; and, in the majority of cases it can be. In my opinion, amalgams should be used only when the cavity of the tooth is so large as to endanger a fracture of the walls, by the pressure required to weld the gold foil, or when the tooth is too tender to allow pressure upon it from any cause. I may be permitted to observe, however, that frequently a tooth will be exquisitely sensitive when amalgam is applied; yet, at the expiration of twelve months or more, the amalgam will appear to have had the effect of removing all tenderness, and a perfect gold foil plug can be introduced without the slightest pain to the formerly tender cavity.

For some years in our early knowledge of amalgams, nothing but silver coin was amalgamated with mercury. This, from discoloring the teeth so much, gave rise to improvements in that respect; and, although it formed a very hard and useful compound, its tendency to oxidation was a great objection to its use, especially in the side-front of the mouth. Other amalgams were substituted, and among them pure silver amalgam, which does not discolor when both silver and mercury are *perfectly pure* (as in all amalgams the metals must be, to ensure perfect results;) but it is too friable for long endurance, and is not so much used as formerly. Amalgams of platinum, and of gold and platinum, have been much used, and with pretty good results, though, from some cause or other, I have found them variable in the preparation.

A new compound has lately been introduced to us by Mr. Evans, of Paris, in the "Dental News Letter," for January, 1850. He describes his compound, which is an amalgam of tin and cadmium; and although it has not

succeeded to the extent of his anticipation, yet he merits our thanks for his undisguised and honorable communications on the subject—perhaps as much for his retractation *under his sanction*, as for its introduction. It certainly promised, in the outset, to be a great boon, principally from its great facility of application and endurance of color. Its title to this latter property, however, is questionable in many cases, and, in some patients of delicate health, it is subject to the same objection as any other of the amalgams. A more perfect compound is, however now being tested, introduced by Mr. Robertson, of Birmingham; and no doubt that gentleman will not allow the liberality of our American brother to surpass his; but Time, the great test of all things, is necessary for its rejection or adoption.

All the compounds which contain copper quickly become discolored; the amalgam is more compact, but its black color in front is most objectionable. Even gold having a trace of copper in the compound, soon becomes black.

I was favored with a communication, a few months ago, by a gentleman who has for some time employed an amalgam of palladium, and it certainly carried evidence of a beautiful preparation, as compact and of finer texture than the amalgam I use; but I *fancied* it was slightly more discolored than mine.

I will now give the instructions necessary for preparing the amalgam I have so long used. The convenience of the parties making it may, however, alter this mode, without injury to its efficacy: but as most dentists have a solution of nitrate of silver at hand, resulting from their work-room, they may employ it without any loss.

Chloride of silver is prepared by precipitation from the nitrate by adding common salt. A pasty deposit immediately takes place; and, when all the silver is thrown down (which is known by the addition of a few drops of hydrochloric acid not rendering the fluid turbid,) it should be washed and drained, so as to leave a pasty mass. Into this

a piece of zinc is immersed. In the course of two or three days (according to the quantity submitted,) all the silver will be reduced to the metallic state; you then remove the zinc. To ascertain the weight of silver you have to amalgamate, it is necessary to weigh the piece of zinc before submitting it to the paste, and the loss of weight which the zinc sustains will be equivalent to the weight of metallic silver produced. To this may be added six or eight times its weight of pure mercury, which must be triturated in a mortar, with warm water for several hours, or so long as the mass continues in the least to discolor the water. The operator will discover the pasty adhesiveness which the amalgam will require as he proceeds; and for this part of the process it is better to have an excess of mercury, which can be squeezed out, and should leave, at the conclusion of the operation, an amalgam composed of one part of silver and four parts of mercury. This amalgam of silver is to be united with an amalgam of gold.

The amalgam of gold may be prepared by putting ribbons of pure gold (similar in thickness to that which gold beaters commence beating with) into heated, or nearly boiling, *pure* mercury, and in the proportion of four mercury to one gold. This may be poured into a mortar containing water, and washed, as the silver amalgam, so long as the least discoloration appears in the water. This should be freed of its superfluous mercury, and the mass should consist of gold one part, mercury three parts.

It may be well to observe, that these amalgams retain a little water in the interstices of the mass; and to prevent any displacement from the spoon in after use, it is well to dry them, by gently rubbing them with a soft towel, or upon bibulous paper.

The amalgams being now perfectly pure, it may be well to keep in separate boxes the little pellets necessary for combination of the compounds; and the proportions are two parts by weight of the gold amalgam to one of silver. I have found it to become a more compact mass by the

first crystallization, although, should there be any residue, it may be heated, and rubbed up again, with a fresh supply for a future operation. The two pellets had better be triturated thoroughly in a mortar before the compound is submitted to the flame of a spirit lamp; and I have observed that, forthe better incorporation, it is necessary to submit it to heating and trituration in the usual way, three or four times. The cavity of the tooth being quite prepared for the reception of the amalgam, all the mercury that can be pressed out between the thumb and fingers should be so separated and the compound immediately packed in the cavity. A little nicety is requisite in keeping, by gentle trituration, between the thumb and finger, the compound in as hard, and at the same time as pasty a state as possible, so as to prevent it becoming friable or crumbling during its introduction.—*Pharmaceutical Journal, March*, 1850.

ART.—LXIII.—NOTICE OF THE COPALCHI BARK.

A new and valuable Bitter, analogous to the Cascarilla.

By James Stark, M. D.

Fellow of the Royal College of Physicians, Edinburgh.

In the course of some inquiries into the remedies used in Chili and Peru, I received from one of my correspondents in Chili a bitter bark under the name of *Natri*, which was stated to be much employed by the medical practitioners and natives of Chili in the treatment of intermittent and other fevers, and held in higher repute than even Peruvian bark itself. The bark and leaves sent enabled me to ascertain that the Natri was the produce of a species of Croton, but from the want of the flowers and fruit, the particular species could not be ascertained.

In the course of a correspondence with my friend John Elliott Howard, Esq., Tottenham, he mentioned to me that a quantity of bark had been received by the Messrs. Gibbs, of London, from San Blas, which appeared to be analogous to, if not identified with, the *Natri*. A small quantity of the same bark had also been brought over from Santa Cruz, by a gentleman, who stated that it was there known under the name of *Chiquique*, and was *always* given to the Indians in fever cases, and was considered by the medical practitioners there as superior, in certain cases, to Cinchona bark itself.

Mr. Howard at once recognised this bark as the Copalchi bark of Goebel, a valuable Mexican bitter, described by him as the product of the Croton suberosum ; and through the liberality of the Messrs. Gibbs, that gentleman sent me first a few pounds to make trial of it in practice, and then the whole quantity imported into this country.

Though it has not been in my power to lay my hands on Goebel's description, I have satisfied myself as to this bark being that known in Europe since 1825, and described under the names of *Copalchi bark* and *Quina blanca*,— the product of one tree variously termed *Croton suberosum* by Humboldt, Bonpland, Kunth, &c. ; *Croton pseudo-china* by Schlechtendal and Nees von Esenbeck ; and *Croton Cascarilla* by Professor Don.

The description of the bark given in the *Dictionnaire Universelle de Matière Medicale*, accurately corresponds with the specimens in my possession, as does also that given in the *Dict. des Drougues Simples et Composées.* In these articles it is described as a new and valuable bitter used in Mexico, similar in properties to Cascarilla, and believed to be the produce of the Croton suberosum of Humboldt.

It is to Schiede and to Nees von Esenbeck, however, that we are chiefly indebted for ascertaining the exact species of plant which yields the Copalchi bark, and showing by their descriptions and figures that the tree which they

describe as yielding it is that formerly called by Humboldt the *Croton Suberosum.* Schiede, as well as Nees von Esenbeck, found this Copalchi (which is the Indian name) sold in the Apothecaries' and Druggists' shops at Jalapa, and over the province of Mexico, under the name of *Quina blanca* and considered by them there as the finest and best sort of Cascarilla. Indeed, Schiede was so convinced that he had discovered the true source of the best cascarilla, that from the examination of the tree which produces this Quina blanca, he asserted that the best Cascarilla was the produce of the Croton Pseudo-china of Schlechtendal—now called by Professor Don the Croton Cascarilla.

Nees von Esenbeck only went the length of considering the Copalchi as closely resembling the Cascarilla, and gave, in the supplement to his splendid work, the *Plantæ Medicinales*, most beautiful colored figures of the copalké-croton in all its states, flowers, fruit, leaves, and bark, rendering it perfectly impossible ever hereafter to mistake the bark or plant which he describes. He also terms the tree the Croton Pseudo-china.

Copalchi bark was subjected to a minute analysis by Mercadieu, in 1826, who found it to contain no crystallizable alkaloid, but the following principles:—1. An astringent matter of a deep brown color. 2. An excessively bitter principle (containing also an astringent principle,) soluble in water. It is in this bitter principle that the febrifuge properties reside which the physicians at Vera Cruz have recognised it to possess. 3. A green fatty substance. 4. A clear brown resin, insipid and inodorous. 5. A brown animalized coloring matter, insoluble in ether and absolute alcohol, but soluble in dilute alcohol and in water. 6. Starch. 7. Woody fibre. 8. Phosphate and oxalate of lime. The burnt ashes yielded hydrochlorate and sulphate of potass, oxides of iron and of manganese, carbonate and phosphate of lime, with traces of magnesia and silica.

Brandes, who analyzed this bark the year following,

could not detect any crystallizable alkaloid, but recognised the bitter principle on which its active properties depended—a resin, concrete fatty oil, &c.

This bark is now undergoing a minute analysis by Dr. Douglas Maclagan and Dr. Anderson. Meanwhile, my friend, Mr. Howard, has made some trials to prepare the bitter principle in a pure state. The bark was exhausted by almost absolute alcohol; this tincture evaporated to dryness; the bitter principle removed from this extract by cold water, which left the residuum of waxy matter, and, on evaporating this aqueous solution to dryness, the bitter principle was obtained in dark brown, almost black, lustrous, but non-crystalline scales, of an intensely bitter taste. The bitter principle thus procured possesses the strange property of being deliquescent, requiring it to be kept in closely stoppered phials.

Copalchi bark yields an agreeable aromatic bitter to water, but especially to proof spirit. The tincture and spirituous extract, indeed, are agreeably aromatic, and on first tasting, leave on the tongue and palate a sweetish taste.

Since I have received the first samples of Copalchi bark, I have made trial of it in a few cases, which seemed tolerably well fitted for testing its properties,—if it possessed any.

The first case was one of atony of the stomach and bowels, with weak and imperfect digestion, and irregular action of the bowels, at one time costiveness, at another slight diarrhœa, existing. In this case, the usual bitters, as gentian, quassia, and columbo, disagreed, exciting nausea, &c., while Peruvian bark and quinine increased the headache, and induced a feverish state of the system. The case, however, wonderfully improved under the use of the simple infusion of the Copalchi of the strength of half an ounce of bark to the pint of boiling water given in tablespoonful doses three times daily.

In the second case in which trial was made of Copalchi bark, the patient suffered from irregularity of the bowels, but with this peculiarity (several instances of which came under my not ce during the past winter during the preva. lence of cholera,) that twice daily, viz., at three o'clock afternoon and three o'clock morning, more or less violent spasmodic cramp in the bowels came on, preceded by shiverings and coldness, and terminating by a sweating stage Quinine, in 1½ grain doses, twice daily, had been given for two days, with the effect of completely checking these intermittent paroxysms, when it was obliged to be stopped in consequence of its inducing violent headaches, flushing of face, and feverishness. The paroxysms immediately returned as before, but, on substituting infusion of Copalchi, giving a wine-glassful at two o'clock afternoon, and the same quantity at bed time, the paroxysms were arrested, and have not since returned.

Like relief followed in another but milder case of the same nature. In this case the cure was trusted entirely to the Copalchi, no other medicine being being given, in order to see whether it really possessed any anti-periodic powers. It is, therefore, scarcely possible to doubt that it possesses some anti-periodic virtue, so that we can easily believe what is stated of its powers by the Mexican and Peruvian Physicians in arresting the paroxysms of intermittent fevers.

It has been used in several other cases, but without the results being so striking as to render its superiority to other bitters unquestioned. I am at present giving it in a case of epilepsy, in which all other bitters had disagreed, excepting that much neglected but valuable bitter, the trefoil (*Menyanthes trifoliata,*) and the case, so far as it has gone, has succeeded satisfactorily under the use of the Copalchi bark. Dr. Bennett informs me that he is administering it to an epileptic case in the Royal Infirmary, apparently with marked benefit.

When I received the first few pounds of Copalchi bark, I sent some to the Royal Infirmary, and to the two principal Dispensaries, in order to let this bitter get a fair trial. I have not yet received reports from these institutions, but learn that in every case that this bitter has been administered, it has given satisfaction, proving an agreeable light bitter. Being now in possession of the whole importation of this bark, through the liberality of Messrs. Gibbs, and being anxious that its powers should be fairly and thoroughly tested by the medical men of Edinburgh, parcels of it have been sent to the Royal Infirmary, to the New Town and Royal Dispensaries, and to the Leith Dispensary; and the remainder lies with the Messrs. Duncan and Co., Druggists, at whose shops in Edinburgh and Leith, small quantities of the bark may be obtained gratuitously, by those who wish to prepare it for themselves. The Messrs. Duncan and Co., will also keep the infusion, decoction, tincture, and spiritous extract ready for prescription, charging merely for the trouble and cost of materials used in the preparation, as the bark itself is *not to be sold* at present. Should the bark be found to prove a valuable addition to our stock of bitters, it could soon be procured from Mexico and Peru in any desired quantity; meanwhile, I would invite the profession in Edinburgh to make trial of it, and shall feel much obliged if they will make the results of their trials known to me.

It appears to me, that one of the great wants in the medical practice of the present day is, a good light bitter of some real therapeutic powers. Most of the bitters in common use are harsh, disagreeable, and heavy, often exciting nausea, aggravating rather than allaying the irritability of a stomach already too irritable. To avoid these it has become of late too much the practice to employ quinine, bebeerine, strychnine, or other concentrated bitters or alkaloids, which in many cases do more harm than good. Satis-

fied I am of this, that in dyspeptic cases especially, by employing the alkaloids or bitter principle, separated from the aromatic, resinous, or other principles with which they are usually associated, we destroy to a great extent the therapeutic powers of the drug, and fail to derive those benefits which we should receive from making use of a spirituous extract, a tincture, or even the simple infusion or decoction of the drug. The warm aromatic principles, associated with the powerful bitter in the Copalchi, seem to me to supply the want of a light bitter, which most practitioners must have experienced; and it is to be hoped, that it will succeed in the hands of others as much as it has as yet done in mine.

It may be remarked, that the infusion and decoction of Copalchi are best made of the strength of half an ounce of bark to one pint of water. The tincture, with one ounce of bark to one pint of proof spirit. The dose of the infusion and decoction is a table-spoonful or small wine-glassful twice or thrice daily. Of the tincture, one or two teaspoonsful, or of the extract from one to two grains, twice or thrice daily.

As Copalchi bark yields freely much coloring matter, might it not be employed with advantage in dying? One, at least, of the crotons yields a valuable dye; and even the cascarilla itself is used in France as a dyestuff, yielding a rich black color, which is easily fixed on stuffs little fitted for receiving fine dyes.—*Pharmaceutical Journal, April* 1, 1850.

VARIETIES.

On the therapeutic action of Digitalin. By Dr. Strohl. The action of digitalin is the same as that of digitalis, of which it is consequently the true active principle. There is, therefore, a great advantage in using this substance because it constitutes an identical and invariable preparation. It is of course important to be aware of the doses of this principle, as it is so much more active than the digitalis itself. The following are the conclusions arrived at by M. Strohl relative to the therapeutic action of Digitalis and its administration :—

1st. Digitalin has no particular action that distinguishes it from the drug, its indications are therefore the same as those for digitalis. 2d. Its sedative action on the heart may fail. 3d. It acts easily on the stomach and brain. 4th. In certain cases it diminishes the dyspnea without lowering the number of palpitations of the heart. 5th. It has the great advantage over digitalis of being always identical in composition and consequently being more sure in its effects. 6th. The solution is preferable to the solid form. 7th. Its administration is commenced with one miligramme (1-65th of a grain) per day, and each dose is augmented generally half a milligramme daily until it increases to five or six milligrammes 1-14th to 1-11th of a grain.)—*Jour. de Pharm., from Gazette Médicale de Strasbourg*, 1849.

On some Tests for Quinine. By Dr. Vogel, Jr.—A very characteristic test for sulphate of quinine has already been pointed out by Brandes. It consists in mixing a solution of sulphate of quinine with chlorine water, and then adding caustic ammonia, when the liquid strikes an emerald green color. Starting from this experiment, I have suc-

ceeded, by the use of some other reagents, in producing some highly remarkable changes of color in a solution of the sulphate of quinine.

If an excess of a concentrated solution of the ferrocyanide of potassium, instead of ammonia, is added to the solution mixed with chlorine water, a dark red color is instantly produced, which persists some hours, but then passes into green, especially when exposed to the action of light. This reaction is highly characteristic of quinine. If caustic potash is used instead of the ammonia, the solution acquires a sulphur-yellow color. A solution of chloride of lime mixed with muriatic acid may be advantageously substituted for the chlorine water, in which case a green powder falls on the addition of ammonia. As the above reactions do not take place with cinchonine, they may be considered as distinguishing characters of the two alkaloids.—*Chem. Gaz. from Leibig's Annalen, Feb.* 1850.

Chinese "Rice Paper," or "Bok-Shung."—Thanks to our most obliging friend, Capt. Wm. Lohring, R. N., who has put us in communication with several intelligent gentlemen now resident in China, we are in a fair way of obtaining correct intelligence relative to many interesting scientific objects, and of having our doubts solved on some important botanical matters. J. H. Layton, Esq., H. B. Majesty's Consul at Amoy, China, has most kindly sent us, not only excellent specimens of the *pith*, from which the so called *Rice-paper* is formed, but a model of the knife used in cutting it, and, what is even of more value, the following information:—

The substance, commonly called *Rice-paper* by the Chinese, is made from the pith of a plant or tree, which grows principally in the swampy grounds in the province of *Sam-swi*, in the northern part of the island of Formosa, where it is said to form large forests. The bark and rind are previous to exportation, stripped from the pith, which is then called *Bok-shung*.

The iron knife commonly used for cutting this pith weighs about 2¼ pounds, and is of the roughest and coarsest workmanship,* and perhaps not one blade in twenty is sufficiently well tempered to be advantageously used. In cutting, the knife is kept quite steady, the cylindrical pith being moved round and round against the edge of the knife, which is just inserted into the substance, and thus a leaf or sheet is formed, resembling the most delicate paper, but rather thick in substance. When brought quickly from the workman's hand's, the paper is in a damp state. It may have been rendered so, in order to facilitate the smoothing and pressing.

At Chang-chew, the large city of which Amoy is the sea-port, there is only one man who can cut this paper. This person ran away from his master in Formosa, and refuses to teach his trade except for a premium of sixty dollars.

It is said that there is a neat method of joining this paper when broken, and that it is chiefly made from the smaller pieces of the *Bok-shung*, and that the larger pieces are used in medicine in the same way as Epsom salts.

It is in vain to conjecture, from the pith alone, to what plant or tree this exquisitely beautiful substance belongs. The vulgar opinion still generally prevails, that, because it bears the name of *Rice-paper*, it is manufactured from rice; but the slightest inspection with a microscope exhibits the exquisitely-delicate medullary portion of a dicotyledonous stem. Again, from an affinity with the well known *Sholat* of the East Indies, many have supposed, and even Chinese travellers have declared, that *Rice-paper* is made from this, the *Æschynomene paludosa*. But a comparison of the

*The model (of wood) sent would indicate this. It has a very broad, straight blade, and a short, straight handle, and is more like a small bill-hook, (wanting the hook) than a knife.

†Of which floats and buoys for fishermen, and the very light hats of Sincapore, are made.

two will clearly show the difference. Both are light and spongy; but the *Shola* is far less delicate than the *Bok-shung*, and is always exported "peeled," the external coatings being removed; whereas the *Shola* is always sent covered with its thin brown bark. A chinese drawing of what is said to be *the Rice-paper plant* is in possession of Dr. Lindley; but neither flower nor fruit is represented. Some have conjectured this to be a Malvaceous plant, others Araliaceous. We have seen in the branches of the common fig, *Ficus Carica*, a copious medulla, very much resembling, in its texture and pure whiteness, that of the *Bok-shung*.

We have the gratification of knowing that our Consul at Amoy will use his best endeavors to procure flowering specimens of the plant itself.—*Pharm. Journ, May* 1, 1850, *from Hooker's Journal of Botany.*

Iridescent Paper. By A. WAGNER.—Eight parts of gall nuts, five parts of sulphate of iron (as free from oxide as possible,) one part of sal ammoniac, one part of sulphate of indigo (blue pot,) and one-eighth part of gum arabic, are to be boiled with water, and preserved in a well closed vessel. If paper washed with this decoction be exposed to the influence of ammoniacal gas, it becomes covered with colors like those of blue steel. Some tints are, however, easily rubbed off. The addition of sulphate of indigo in sal ammoniac, serves only to protect the protoxide of iron contained in the ink from a higher degree of oxidation.—*Ibid., from Pharm. Central Blatt., für* 1850, P. 156.

On the Purification of Honey. By ANDRE V. HIRSCHBERG.—In the *Archiv. d. Pharmacie* XXIX. p. 308, the following method of purifying honey is recommended by André:—Twenty-five pounds of honey are to be diluted with half that quantity of water and boiled, with a pulp obtained by stirring three sheets of white blotting paper

with water, over a slow fire, till the pulp is resolved into fine fibres. When cold the whole is placed on a woolen previously moistened filtering-bag, through which the honey soon runs off as clear as wine. The residual paper pulp is then washed, and the dark wine-yellow liquid thus obtained evaporated in the vapor bath. The thus obtained honey answers, according to the observations of Hirschberg, all purposes for which a faultless, purified honey is required.—*Pharm. Journ., May* 1, 1850.

Unguentum Potassii Iodidi. By A. W. Brieger.—From a number of experiments made by Brieger, with regard to the preservation of this ointment, he concludes that 1. Both carbonated and calcined magnesia not only do not prevent this ointment from becoming yellow, but rather promote the decomposition of the iodide of potassium; 2. Carbonate of potash is better adapted for this purpose; but 3. A solution of caustic potash is more effective, a few drops being sufficient to preserve from four to eight ounces of ointment for many months without becoming yellow, or to restore the white color to such as had already become yellow.—*Ibid., from Jahrbuch. für prakt. Pharm.*

New Gunpowder.—M. Augendre, assayer at the Mint of Constantinople, has succeeded in making gunpowder, which is said to be much more powerful than common gunpowder, of a mixture of prussiate of potash and chlorate of potash with sugar. The following are the proportions which have been found to answer best :—

Crystallised prussiate of potash, dried	1 part
White sugar	1 part
Chlorate of potash	2 parts

These ingredients are separately reduced to a fine powder, and then intimately mixed by the hand. In operating on any quantity, the mixture is moistened with a little water and beaten in a mortar, after which it may be granu-

lated by passing it through a sieve, or it may be used in fine powder.

The Academy of Sciences at Paris, to whom Augendre addressed a communication with reference to this explosive compound, referred the subjest to a commission consisting of MM. Poibert and Morin, who reported thereon to the following effect :—

The advantages of this gunpowder are :

1. That it is formed of substances which have a fixed and determinate composition, which enables us to depend upon obtaining a product uniform in strength.

2. That these substances are unalterable by the action of either dry or damp air, so that they may be kept for an indefinite period, which is not the case with the charcoal employed in the manufacture of ordinary gunpowder.

3. That the manufacture requires less time, and that larger quantities of the ingredients may be stored away, and be combined as occasion may require, thus rendering large powder magazines unnecessary.

4. The dynamic effect is much greater than that of ordinary gunpowder.

5. That the product in fine powder being equally as effective as that in the state of grain, enables us to obtain the various substances of which it is composed in the state of an impalpable powder by means of ventilation, and mixing them in the dry state in a leathern barrel, turning on its own axis.

6. That the prussiate of potash is not poisonous, but simply a saline purgative salt.

On the other hand, the disadvantages are :—

1. That the chlorate of potash contained in this powder causes the oxidation of steel fire-arms, and thus confines the employment of this powder to artillery.

2. That it is more readily inflamed than ordinary gunpowder, although much less so than all the gunpowders which have hitherto been made containing chlorate of potash.—*Pharm. Journ., May* 1, 1850.

Editorial Department.

THE AMERICAN JOURNAL OF PHARMACY.—Coincident with the issue of this number of the Journal, we have to announce the resignation of Dr. Joseph Carson, of his Editorial connection with it. It is now about fourteen years, since Dr. Carson assumed its Editorial supervision, and during this long period he has guided its helm with a steady and unwavering hand among the difficulties that beset it, especially at a time when the accessories to the support of the Work were far more meagre than at present. The mass of volumes that bear his name on their title pages are a testimony to his industry and perseverance.

During nearly the same period, Dr. Carson has occupied the Chair of Materia Medica in the Philadelphia College of Pharmacy, wherein he has illustrated his favorite pursuits with an ability that has earned for him an enviable reputation as a teacher of that important branch of instruction.

It is not surprising therefore that the TRUSTEES of the UNIVERSITY OF PENNSYLVANIA, in making their selection of a teacher to fill the vacancy occasioned by the transfer of Dr. Wood from the chair of MATERIA MEDICA AND PHARMACY, to that of PRACTICE, should have given their preference to Dr. Carson, who, we are gratified to state, is the successor of Dr. Wood.

In view of his new duties, Dr. Carson has resigned his connection with our School of Pharmacy, and with this Journal, in an official capacity, but we believe the deep interest he has ever felt and manifested for the advancement of our profession and the interests of our Institution will continue, and whilst we regret the loss of his services, we cannot but rejoice at his removal to a more elevated and extended sphere of usefulness.

The Editorial duties of the Journal will now devolve solely on the remaining Editor, who will thank those who are in the habit of communicating with the Journal of Pharmacy to direct to "William Procter, Jr." In conducting the Journal it will be the endeavor of the Editor to preserve its scientific standing undiminished, and to increase its practical usefulness.

Philadelphia College of Pharmacy.—The vacancy in the Chair of Materia Medica in this Institution, caused by the resignation of Professor Carson, has been filled by Dr. Robert P. Thomas of this city.

Drug Inspectors.—We recollect distinctly during a period prior to the enactment of the law against the importation of adulterated and deteriorated drugs, medicines, and chemicals, when the probable usefulness of such a law was discussed, it was suggested that the officers appointed by the government to carry it out would be subject to removal for political creed, and all the advantages accruing from experience in office would be lost by frequent change, not to speak of the chances of unqualified men receiving the appointment. The moral, intellectual and educational fitness of the officer for the position cannot be too strongly insisted on in filling this station—it is not a mere question of dollars and cents between the government and the importers that he is called upon to arbitrate—it is whether deteriorated drugs shall be poured upon our shores from the rejected stock of Europe, to be bought up and dispensed by the unprincipled and the ignorant—it is whether adulterated medicines and chemical preparations shall be scattered far and wide over our country to disappoint the skill of the physician and render his weapons useless in their inactivity—it is whether the stricken one, prostrated by disease, the centre of deep and anxious sympathy, shall be hastened to the tomb through the impotency of medical agents which, when pure, are able to conquer and check its inroads. These are questions which the Honorable Secretary of the Treasury, Mr. Meredith, of Philadelphia, should have examined before he interfered with the action of this wholesome law, by removing an incumbent well qualified for the position by education and talent, and enjoying the confidence and respect of the Importers, Druggists and Physicians, of this city, and replacing him by—whom?! Is it true that the present incumbent enjoys the confidence and respect of that portion of the community with whose interests he is concerned? Is it true that he possesses that knowledge and those qualifications which a conscientious discharge of the duties of the office demand? If so, why is it that a remonstrance, the spontaneous expression of a highly respectable class in the community, should have gone to the appointing power? Better, far better, that the inspectorships had never been created, than by making their executors the subject of political reward for partizan services, to risk its being filled by men wholly unfit for the service, and whose inspection will be far from giving character to the drugs that pass through their hands.

Since the above was written, the Board of Trustees of the Philadelphia College of Pharmacy have felt themselves called upon to memorialise the Honorable Secretary of the Treasury in reference to this subject; and we hope that the Honorable Secretary will so far respect the appeal as to appoint some one, we care not whom, who is adequate to the discharge the highly responsible duties of this office.

Imported Pharmaceutical Articles.—Our attention has been called to several pharmaceutical articles imported by George D. Phelps of New York, and among them may be mentioned, "Brown's cantharidin blistering tissue," "Brown's tissue dressing," and "Brown's water proof transparent plaster." It has long been usual in Europe to employ blistering tissues instead of the ordinary blistering plasters in which the flies are introduced in substance. When such tissues are fully impregnated with cantharidin they form a very elegant substitute for the cerate of cantharides spread on skin, and are equally certain. The tissue above noticed consists of a flexible paper covered uniformly with a layer of cerated extract of cantharides. At page 226 the reader will find a notice of this kind of preparation. We think they may be introduced with advantage into American pharmacy.

The article called "Brown's Tissue Dressing" consists of tissue paper covered on one side with a thin layer of rose colored cerate which has been impregnated with benzoin to prevent its becoming rancid. We do not know the composition of the cerate but presume it to be analogous to spermaceti cerate. Its odor is evidently that of benzoin, which substance is well known to possess the power of preventing in great measure the oxidation of fatty matter. For travellers, or for naval or military hospital purposes, we believe it will be found useful. We do not know how it keeps, nor whether it is applicable in all cases, but as a dressing for blisters it is a very elegant accompaniment to the blistering tissue. Each box contains twelve square feet of the tissue.

"Brown's water proof transparent plaster" consists of a coarse white gauze coated continuously with a layer or layers of gelatine prepared in some way. Why it is called water proof we do not know, as it is not impervious to water or saliva. It is very adhesive, but would, we think, be of questionable utility in cases where the surfaces was frequently moistened.

Hair gloves, straps, and flesh brushes, have of late years come into vogue as an auxiliary in those daily hygienic performances which are intended to keep up a healthy condition of the skin, by friction, with ablution or otherwise. We have examined several of the patent

gloves, straps and brushes of Lawrence & Co., as imported by Mr. Phelps, and from the neat and substantial manner in which they are made, believe them to be a superior article, and worthy the attention of druggists and physicians. Those gloves and straps which are intended for bath use, are constructed of material not injured by the water, whilst the flesh gloves and straps are lined with cotton or worsted velvet.

Coxe's patent refined sparkling gelatin is an elegant article, which we have tried and found to yield a beautiful jelly.

Murray's *fluid magnesia, and fluid camphor*, are among the preparations imported for druggists by Mr. Phelps. The first of these, which is a solution of carbonate of magnesia in carbonic acid water has justly fallen into disuse, as it is liable to change by keeping, owing to the escape of carbonic acid. The fluid camphor is a mixed solution of camphor and carbonate of magnesia in carbonic acid water. It professes to contain three grains of camphor and six of magnesia, in a fluid ounce, and is antacid and antispasmodic in its effect. We do not think that this fluid camphor contains more camphor than camphor water when prepared with three times its weight of carbonate of magnesia so as to divide it as much as possible.

Powdered Drugs.—Notwithstanding the many valuable improvements in the extraction of drugs, so as to present their active portion in a form more eligible for administration, many physicians prefer their use in substance and consequently require them in a pulverulent state. Whilst as a general rule, in those cases where the powders are rarely called for, we consider it advisable for apothecaries to perform the process of comminution themselves, both to insure their quality and have them recent, yet there are very many which it is a desideratum to obtain ready prepared and of approved quality.

The important points are, 1st, that these powders should be prepared from good drugs. 2d, they should be very fine or dusty. 3d, that they should be uniform in composition; that is to say, that each portion of the powder should represent equally every part of the substance comminuted, which can only occur when the results of an operation are mixed thoroughly, so as to commingle the more with the less friable ingredients. 4th, the powders should be secured from the air as soon as finished, to prevent the absorption of moisture, followed by mustiness or mouldiness, as the case may be. And lastly, when the drug contains a volatile ingredient, as is the case with Valerian, Diosma, Serpentaria, &c., that this or these be not dissipated to a greater extent than the most careful manipulation will demand.

Our attention was called to this subject by receiving some samples of powders from the laboratory of Charles Ellis & Co.

In judging these powders by the rules above hinted at, we believe them to be of superior quality. We were struck with those of buchu, orangepeel and others containing volatile oils, and those of gum, rhubarb, and aloes, where color is a criterion, as being particularly well prepared.

We have seen some powders from Haskell & Merrick of New York, which equalled those above noted, and we are gratified to perceive that more attention is being given to this class of preparations by our druggists.

Pharmacopœia Convention.—The decennial convention of Physicians and Pharmaceutists for revising our National Pharmacopœia, met according to previous announcement, on the 6th of May, at the city of Washington. The delegates were not so numerous, and did not represent so extended an area of our population, as we would have been glad to have seen, being nearly altogether from the middle and northern states. The Convention was, however, larger than in 1840. The following statement by the Secretary of the Convention appeared in the National Intelligencer at Washington, except those portions enclosed in brackets.

NATIONAL MEDICAL CONVENTION,

For Revising the Pharmacopœia of the United States.

The fourth decennial convention for revising the Pharmacopœia of the United States, met at Washington on Monday, the 6th inst. The following delegates were present in the Convention :

From the Rhode Island Medical Society, Dr. Joseph Mauran.

From the Geneva Medical College, Dr. James Bryan.

From the College of Pharmacy of the City of New York, Messrs. John Milhau and George D. Coggeshall.

From the Medical Society of New Jersey, Drs. Lewis Condict and Wm. A. Newell.

From the College of Physicians of Philadelphia, Drs. Joseph Carson, Henry Bond, and Francis West.

From the University of Pennsylvania, Drs. George B. Wood, and James B. Rogers.

From the Jefferson Medical College of Philadelphia, Dr. Franklin Bache.

From the Medical Faculty of the Pennsylvania College, Dr. H. S. Patterson.

From the Medico-Chirurgical College of Philadelphia, Dr. Clinton G. Stees.

From the Philadelphia College of Pharmacy, Messrs. Daniel B. Smith, Charles Ellis, and William Procter, Jr.

From the Medical Society of Delaware, Drs. ISAAC JUMP and J. W. THOMSON.

From the Medical and Chirurgical Faculty of Maryland, Drs. DAVID STEWART and JOSHUA I. COHEN.

From the Medical Society of the District of Columbia, Drs. J. C. HALL and HARVEY LINDSLY.

From the National Medical College of the District of Columbia, Drs. JOSHUA RILEY, THOMAS MILLER, and EDWARD FOREMAN.

From the Medical Department of the National Institute, D. C., Drs. JAS. WYNNE and S. D. GALE.

From the Georgetown Medical College, Dr. F. HOWARD.

And from the Rush Medical College, Illinois, Dr. G. N. FITCH.

The credentials of delegates from the New Hampshire Medical Institution, the University of Buffalo, the Medical Department of Hampden Sidney College, the Medical Society of South Carolina, the Medical College of Ohio, the Cincinnati College of Pharmacy, the Missouri Medical Society, and the Medical Faculty of the University of Iowa, were presented by the Vice President of the Convention of 1840; but these delegates did not make their appearance during the session of the convention.

A temporary organization was effected by calling Dr. LEWIS CONDICT, President of the Convention of 1840, to the chair, and appointing Dr. HARVEY LINDSLY, Secretary. A committee of five was then appointed, consisting of Dr. Bache, Dr. Mauran, Dr. Thomson, Dr. Miller, and Mr. Coggeshall, to nominate the permanent officers of the convention, with instructions to name two Vice Presidents, in stead of one, as had been the custom on former occasions. This committee retired, and, after a short consultation, reported the names of the following delegates, viz:

For President, Dr. GEORGE B. WOOD, of Pennsylvania.

For Vice Presidents, Dr. JOSEPH MAURAN, of Rhode Island, and Dr. D. Y. SIMONS, of South Carolina.

For Secretary, Dr. HARVEY LINDSLY, of the District of Columbia; and for Assistant Secretary, Dr. EDWARD FOREMAN, of the same place.

The nominations were confirmed by the convention, and the President took the chair.

[A committee of three were appointed to examine the credentials of the delegates who reported in acco rdance with the preceding list.

It was on motion *Resolved*, that an invitation be extended to the Surgeon General of the Army, and the Chief of the Naval Bureau of Medicine and Surgery to sit with the Convention and take part in its proceedings.

And after some discussion, it was further *Resolved*, to invite such members of the two Houses of Congress as might be medical graduates, to participate in the deliberations of the convention.]

In conformity with the directions of the preceding convention, the Committee of Revision and Publication appointed by that body, presented a report of their proceedings, which was accepted.

The delegates of the several medical bodies represented in the

Convention were then called on for contributions towards the revision of the Pharmacopœia; when reports were handed in from the delegates of the Rhode Island Medical Society, from the College of Pharmacy of the City of New York, from the College of Physicians of Philadelphia, from the Philadelphia College of Pharmacy, and from the Medical and Chirurgical Faculty of Maryland. These reports were referred to a committee, consisting of Dr. Bond, Dr. Mauran, Dr. Cohen, Dr. Miller and Mr. Milhau, with directions to report a plan for the revision and publication of the Pharmacopœia; after which the convention adjourned to the following day.

At the next meeting, on Tuesday morning, a committee was appointed to examine the accounts and vouchers presented by the Committee of Revision and Publication of the preceding convention, and reported that they had found them correct.

Dr. Bond, from the committee to which had been referred the reports from various medical bodies represented in the convention, reported the following resolutions:

1. That a Committee of Revision and Publication, consisting of nine members, be appointed, to which shall be referred all communications offered to the convention in relation to the revision of the Pharmacopœia, and that three of this committee shall form a quorum.
2. That the committee shall meet in the city of Philadelphia, and be convened as soon as practicable by the chairman.
3. That said committee shall be authorized to publish the work after its revision, and to take all other measures which may be necessary to carry out the views and intentions of the convention.
4. That the committee shall have power to fill its own vacancies.
5. That, after the completion of its labors, the committee shall submit a report of its proceedings to the Secretary of this convention, to be laid before the next convention.

These resolutions were adopted, and the following delegates appointed on the committee, viz.: Dr. Franklin Bache, Dr. Joseph Carson and Mr. William Procter, Jr., of Philadelphia; Dr. Joseph Mauran, of Providence, Rhode Island; Mr. John Milhau, of the City of New York; Dr. J. W. Thompson, of Wilmington, Delaware; Dr. David Stewart, of Baltimore; Dr. Joshua Riley, of the District of Columbia; and Dr. G. N. Fitch, of Logansport, Indiana.

It was resolved that the President of the convention be added to the above committee, and serve as its chairman.

[Mr. Coggeshall suggested the propriety of restoring the Latin version of the Pharmacopœia as it existed previously to the revision of 1840, as recommended in the report of the New York College of Pharmacy. After a full and spirited discussion of the question in point of expediency, in which the increasing disposition of Pharmacopœial authorities to drop the classical and adopt the vernacular was shown, the recommendation was unanimously *negatived*.]

In reference to the manner of calling and the mode of constituting the next decennial convention, to meet in the year 1860, it was

Resolved, That the regulations in reference to the present conven-

tion, adopted by that of the year 1840, and published in the last edition of the Pharmacopœia, should be adopted, with the necessary modifications in relation to the dates; the day of meeting being changed from the first Monday to the first Wednesday in May.

A letter was read inviting the members of the convention to a dinner, to be given at the National Hotel, by the medical gentlemen of Washington and Georgetown. The invitation was accepted, and the thanks of the convention voted to the gentlemen referred to for their hospitality.

The thanks of the convention were also unanimously voted to Dr. Lewis Condict, President of the last convention, for valuable services; and to the Board of Aldermen, of the city of Washington, for their courtesy in offering their hall for the sittings of the convention.

The convention then adjourned.

After its adjournment, Dr. William B. Chapman, one of the delegates from the Cincinnati College of Pharmacy, arriving in Washington, stated to the Secretary his concurrence in the proceedings of the convention.

HARVEY LINDLEY, M. D.,
Secretary of the Convention.

It will be perceived that the profession of Pharmacy was represented in the Convention, and that a part of the Revising Committee are pharmaceutists. It may interest some of our readers to know that this Committee has been organized and has commenced its labors. For the information of the members of the Convention, and others who may feel an interest in the object of its appointment, we will state that the Committee meets every Thursday evening in this city. As it is desirable that the work should be national in its character, and embrace within its contents well digested formulæ suited to the *established* wants of all sections of our country, the joint medical and pharmaceutical interests of places not represented by the delegations above indicated, should make known to the Committee such important formulæ and facts as may in their opinion be worthy of its consideration.

GENERAL INDEX.—Our readers will perceive that the General Index to the American Journal of Pharmacy, commenced in the last number, is completed in the present. Subscribers would do well to have the Index bound with the current volume, or what is much better, bound separately so as to be more easy of reference. The utility of this work to those who have frequent occasion to refer to the Journal will be immense; and even where it is used but occasionally, to find a formula, or to verify a statement, its convenience will be readily acknowledged. As our friend Alfred B. Taylor, to whose industry we owe the pleasure of presenting the Index to our readers, declines attaching his name to it, we take this means of informing them to whom they are indebted.

Patent Medicine Tax.—Among the ways and means resorted to by our State authorities to increase the revenue, is a tax laid on the sale of secret or quack medicines, as has long been the usage in England. We have been informed that this law originated at the suggestion of some physicians, who supposed it would bear more specially on empirics and their nostrums, but the executors of the law have interpreted it to apply to all who sell preparations made by secret formulæ, as Henry's and Husband's Magnesia, McMunn's Elixir, and others prescribed by physicians. Now as there are druggists who feel a desire to discourage quackery, and act up to their profession by refusing to sell secret medicines in general, and yet necessarily keep such preparations as the above, it is unjust that they should be taxed as though they were general dealers in nostrums.

The Druggists General Receipt Book: containing numerous recipes for patent and proprietary medicines, druggists' nostrums, &c.; factitious mineral waters, and powders for preparing them; with a veterinary formulary and table of the Veterinary Materia Medica; also recipes for perfumery and cosmetics, beverages, dietetic articles and condiments; trade chemicals, miscellaneous compounds, used in the arts, domestic economy, &c.; with useful tables and memoranda. By Henry Beasley. Philad., Lindsay & Blakiston, 1850. Octavo, pp. 386.

The title of Dr. Beasley's book tells its character; it is in fact a cluster of recipes for medicines, perfumery, soap making, paints, cosmetics, in fact for a thousand things useful and useless, which have become more or less identified with the drug business, and as a book of reference will often be found useful to business men.

Obituary.—We have to announce the death of Dr. Robert Eglesfeld Griffith, in the 53d year of his age, at his residence on Chestnut street in this city.

Dr. Griffith has long been known as a medical writer and teacher, as well as for his general scientific attainments, especially in botany and conchology. In 1831, on the death of Dr. Benjamin Ellis, he assumed the Editorship of this Journal, then known as the "Journal of the Philadelphia College of Pharmacy," and conducted it until 1836. In the spring of 1835, on the election of Dr. Wood to the University, he was appointed to the vacant chair of Materia Medica in the School of Pharmacy, where he delivered one course of lectures. The following year Dr. Griffith was elected to the same chair in the University of Maryland, which he occupied several years, and subsequently accepted a lectureship in the University of Virginia. His health,

at this time so far declined, owing to an affection of the heart, as to render it necessary for him to resign his duties and seek restoration in the milder climate of the West Indies, at Santa Cruz, where he spent the winter. On his return from the South, Dr. Griffith occupied himself with experimental agriculture near Baltimore, and gave free scope to his enquiring mind in that interesting pursuit. He left Maryland in 1842, and has since resided near and in his native city, closely engaged in literary pursuits, chiefly of a medical and botanical character. During this period, "Griffith's Medical Botany," and "Griffith's Universal Formulary," both original works, have issued from his pen, and several foreign works have been republished here under his supervision, the most prominent of which is "Dr. Christison's Materia Medica."

Dr. Griffith was for many years an active member of the Academy of Natural Sciences, and at the time of his death was one of its Vice Presidents. His love of science was ardent and enthusiastic, and was manifested in his correspondence with many of the first scientific minds of Europe.

His health during the past few years has been extremely precarious, so as to confine him almost entirely to the house during the winter season, notwithstanding which, his industry has been unfailing

As a man, Dr. Griffith was so cheerful and amiable as to endear him to all his associates, and so unassuming as to be approachable by all who desired to draw from the stores of knowledge which his observant mind and very retentive memory had enabled him to accumulate, the accuracy of which his friends have frequently had occasion to admire. His cheerfulness never forsook him during the many trying domestic afflictions which have marked the latter period of his career, and which he bore with great fortitude and resignation.

On Wednesday, May 8th, the decease of the justly celebrated Chemist, GAY LUSSAC, took place at Paris